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# Sources of hostility variance in sport situations

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SOURCES OF HOSTILITY VARIANCE IN SPORT  
SITUATIONS

by  
Alan Leslie Burton

An Abstract

of a thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in the School  
of Health, Physical Education  
and Recreation at  
Ithaca College

December 1977

Thesis Advisor     Dr. A. Craig Fisher

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## ABSTRACT

An S-R (situation-response) Inventory of Hostility that related specifically to situations encountered in connection with three contact sports--ice hockey, lacrosse, and soccer--was designed to obtain data in order to test the hypotheses. Once established, the data obtained as a result of the administration(s) of the inventory were utilized to locate the sources of behavioral variation.

The subjects involved in the study were 108 inter-collegiate varsity and junior varsity athletes who participated in one of three contact sports from one of four institutions in New York State during the spring semester, 1977.

A second administration of the S-R Inventory was given to 43 selected subjects from three of the four institutions, across all three sport activities, five to six weeks after the first administration.

The inventory consisted of 15 situations and 11 modes of response (both physiological and psychological). The 15 situations were selected from a possible 43 sport situations, representing both pre-game and game hostility-aggression. The 43 possible situations were given to 30 randomly assigned subjects across the three sports to rate on a one-to five-point scale, as best representing hostility or aggression in their opinion. The final 15 situations were chosen on

the basis of their plausibility, rank, mean score, and standard deviation calculated for the 43 situations. As indicated in the literature, three categories of aggression were intuitively differentiated within the situations. Each category of aggression was represented by a number of situations. The situations, furthermore, ranged from a high to low aggression-hostility evoking. The inventory employed a five-point scale ranging from "not at all" to "very much" on which the subjects were asked to report to what degree they manifested each of the 11 modes of response in each of the 15 situations.

A factorial design analysis of variance model was utilized to determine the relative contributions of variance from persons, situations, modes of response, all of the possible interactions, and residual. The data were analyzed using a mixed effects model as outlined by Endler (79) and Gleser, Cronbach, and Rajaratnam (91). It was determined that persons, situations, and modes of response contributed 20.17 percent, 12.22 percent, and 5.07 percent respectively, to the total behavioral variance. The contribution from the simple interactions combined was 26.89 percent with 15.35 percent attributed to persons x situations, 8.35 percent attributed to persons x modes of response, and 3.19 percent attributed to situations x modes of response. By far the largest single source of behavioral variance (35.35 percent) was attributed to the residual component.

The residual component was further partitioned into

the triple interaction (persons x situations x modes of response) and error variance using 43 selected subjects. The variance percentage for the triple interaction was merely 1.20 percent, while 26.20 percent was attributed to the error term.

It was concluded that neither the person variance nor situation variance were more important in determining behavior in sport related situations for the trait of aggression-hostility. However, variance attributable to persons tends to indicate that hostile-aggressive behavior can be consistent in the sense of being coherent. Furthermore, it was concluded that the simple interactions were found to be as important as the main effects in determining or predicting behavior in sport-related situations. The results were interpreted to be supportive of the interactionist position with the reservation that the largest portion of the total behavioral variance lay within the residual component.

SOURCES OF HOSTILITY VARIANCE IN SPORT  
SITUATIONS

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A Thesis Presented to the Faculty of  
the School of Health, Physical  
Education, and Recreation  
Ithaca College

---

In Partial Fulfillment of the  
Requirements for the Degree  
Master of Science

---

by  
Alan Leslie Burton  
December 1977

Ithaca College  
School of Health, Physical Education and Recreation  
Ithaca, New York

CERTIFICATE OF APPROVAL

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MASTER OF SCIENCE THESIS


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This is to certify that the Master of Science Thesis of


Alan Leslie Burton


submitted in partial fulfillment of the requirements  
for the degree of Master of Science in the School of  
Health, Physical Education, and Recreation at Ithaca  
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## Chapter 1

### INTRODUCTION

Personality is a term used to characterize the individual that emerges as an infant, grows, matures, and reacts to the thousands of environmental stimuli which surround him. Definitions of personality vary according to theoretical viewpoints; personality can be defined from a biophysical viewpoint, from a social learning viewpoint, or from any position between the two and there seems to be little consensus between either viewpoints or definitions. Personality has been perceived as static, as dynamic, and as something between static and dynamic.

The common path in personality theorizing is to define the concept operationally, an essential step in all research undertakings. Perhaps, however, there is no right or wrong definition. Perhaps personality, being the metaphysical construct that it is, denies the answer to this problem. However, if the theoretical framework from which the definition originated was useful in predicting behavior, or allowed for a clearer understanding of behavior, then it is consequently utilized in testing hypotheses often without regard to the underlying assumptions of the theory itself.

A popular discussion and research topic for sport psychologists and coaches has been the role of personality

in athletics. The contemplation of personality has been entertained usually to explain "causative" factors for performance and/or to predict the behavior of athletes in specific sport circumstances. Of these two intents, neither have been successfully concluded at this point in time (11,48). One researcher has doubts that it ever will (48).

A basic premise of almost quasi-mystical potency for such research has been that athletes possess unique and definable personality attributes different from nonathletes. Moreover, athletes in one sport can be readily distinguished from athletes in another sport. One renowned European sport psychologist has even implied the possibility of differentiating athletes via sport from their personality profiles (22,23). If personality attributes were, in fact, differentiating, certain advantages could accrue. First, there might be promise for development of personality techniques for screening of potential athletes, coupled of course with skill level. Secondly, if athletic success prerequisites in terms of personality attributes were established, then possible training modifications promoting and enhancing those attributes might be feasible.

Since personality research in athletics makes use of the theories and research tools developed by personality research in general, it inherits both the good and the bad qualities. Some of the general problems in such research are transferred to athletic personality investigations because of inadequately conceived paradigms. The often confusing results in athletic personality research is con-

fused further when the controversial issue of consistency of behavior is stressed. Theories of personality differ considerably in the extent to which they stress consistency of behavior. An important point of difference is the amount of variability in behavior which personality theories hypothesize is attributable to the person, the situation, and the interaction between them.

Argyle and Little (61) outline four types of behavior (e.g., aggression), in different situations: total person variability, total situational variability, dispositional variability, and interactional variability. These types not only differ in the amount of variability, i.e., person and situation, but also in the way in which the variability is interpreted. Although heterogeneous and somewhat inseparable, at least three main theoretical standpoints can be distinguished from this confrontation. These are the conceptual models propounded by (a) the personologists, (b) the situationists, and (c) the interactionists. In the past, empirical research has leaned heavily upon the two initial models and has viewed personality in terms of traits and in terms of situation-specificity.

Most of the sport personality literature has been based on factor theory. Personality has been assessed as a combination of stable intra-organismic constructs such as "traits," "psychic structures," or "internal dispositions" as the main determinants of behavioral variation. Trait psychology is based on the assumption that personality traits are relatively

stable, consistent attributes that exert generalized causal effects on behavior. Such an approach considers the general source of behavioral variance to reside within the person, refuting the role of total situational variability. The traitist view can be expressed in symbol form as  $B=f(P)$ --behavior is a function of the person.

Mischel (28) has criticized trait psychology for its seemingly low "personality coefficients" (the inimical .30), which are correlations between responses made in different situations by the same person, and which account for less than 10 percent of the total behavioral variance. Furthermore, social behavior theorists propose a model of personality that can be expressed in terms of total situational variability which may be regarded as the antitheses of trait personality theory, and the factor approach. They have presented cogent arguments that there is little evidence that trait-determined behavior is consistent across situations. This theoretical model expressed as  $B=f(S)$ --behavior is a function of the situation--is a paradigm which attempts to account for trans-situational inconsistency.

Brunswik (9), a proponent of the situationist position, argued for a "representative design" in personality research and proposed that situational variability must be considered:

In fact, proper sampling of situations and problems may in the end be more important than proper sampling of subjects, considering the fact that individuals are probably on the whole much more alike than are situations among one another (9:36).

Bowers (76) criticizes the recent over-emphasis on situationism in personality research and theorizing. Con-



siderable evidence is obtained to show that behavior is not consistent within situations across persons. At least 15 investigations were presented which contend that both situations and persons, when directly comparing the percentage of variance accounted for by the two, account for a small percentage of the total behavior variance.

The social learning theory of personality is in direct conflict with trait psychology. Both theories reflect an atomistic as opposed to a holistic approach to personality assessment. Single-minded adherence to either theory promotes such an atomistic view. A more realistic approach would be an interactive one succinctly expressed by Lewin's (33) equation of  $B=f(P,E)$ --behavior is a function of the person and the situation.

Hunt's (97) initial work reflects Lewin's conception of personality and behavioral variance: whether static personality traits constitute the major source of behavioral variance, or that variations in particular situations mediate behavior. Hunt recommended that instruments be designed capable of predicting behavior in various kinds of situations.

The third significant conceptual model to join the personality debate has been the interactionist position; proponents of this model advocate "mutual involvement." Successive studies by Moos (119,120,121,122) related to mutual involvement are demonstrative of the interactionist position. Moos concluded from research undertaken with psychiatric patients and staff that the person-situation interaction

accounted for a larger percentage of behavioral variation than did either total person variability or total situational variability taken independently.

Endler and his co-workers (82,83,84,85,86,87) have espoused the interactionist paradigm in numerous studies, and have done much to establish that the person-situation interactions are more appreciable sources of variance than either person or situational variance components alone. The question of whether trait or situation is the greater source of behavioral variance, Endler (81) regards as a "pseudo-issue." He further implied that this question is like asking whether air or blood is more essential to life. A more sensible question would be: "How do person differences and situations interact in evoking behavior?" It is the work of Endler and others (80,81,82,83,84,85,86,87) that has provided the most damaging evidence to the situationist and trait constructs. With the person-situation dilemma in mind and in reference to initial research incorporating the original S-R Inventories of Anxiousness, Endler and Hunt (84) designed two S-R Inventories of Hostility designed to partition total behavioral variance. The inventories employed two samples of reports of response indicators of hostility with several samples of situations to several samples of subjects. The selection of modes of response was assumed to belong to the hostility category and could be readily validated by means of physiological recordings. The subject samples were asked to relate the extent to which they manifested each of the

modes of response in each of the situations on a five-step Likert scale. After conclusive analysis of the data in 1969, the researchers observed that individual differences contributed almost 20 percent of hostility variance for men while the situations contributed only four percent. However, the modes of response contributed almost 15 percent of the total variance. Nearly 30 percent of the total variance came from the three simple interactions.

The possibility of obtaining the component variance of the triple interaction, considered psychologically significant, has been expressed by Endler and Hunt (85). Inasmuch as a second administration of an S-R Inventory might reflect boredom and negativism as well as hostility, anxiety, or any other characteristic (83), Endler and Hunt (83) were at first content to guess that the triple interaction (person x situation x mode of response) might contribute about 10 percent of the total variance. This indicates that in a particular situation, a particular individual will respond in a particular way. The researchers obtained percentage scores of the total variance for triple interaction ranging from zero to 10.95 percent using different forms of the S-R Inventory of Anxiety (84).

Similar studies, completed by Czarnecki (153) and Horsfall (157) utilizing the S-R Inventory model related specifically to situations encountered in athletics, obtained similar and conclusive evidence of the interactionist's position, i.e., consistently persons and situations each contributed approximately 10 percent of the total variance, while the simple interactions combined accounted for approximately 30

percent of the total variance. In both investigations relating to anxiety in football and basketball situations, respectively, the residual component (triple interaction plus error) accounted for approximately 35-40 percent of the total variance, by far the most significant component. Moreover, the study completed by Czarnecki (153) involved a readministration of the S-R Inventory of Anxiety related to football situations, in order to obtain the percentage of variance due to triple interaction. Czarnecki's results of eight percent variance due to triple interaction tends to substantiate Endler and Hunt's (85) guesswork of 10 percent.

The initial sport related investigations incorporating Endler, Hunt and Rosenstein's (81) original S-R Inventory paradigm has provided further ammunition for the interactionists in the person-situation argument. Such investigations have indirectly provided highly damaging evidence to the current status of sport personality research. It is now necessary to extend this sphere of research specifically dealing with athletics and encompassing other personality characteristics and other sport areas. The question of critical importance is: Will the sources of variance account for similar amounts of variation when the situations are sport-related? In an attempt to generalize across three contact team sports--ice hockey, lacrosse, and soccer--it is hoped that this question will be answered during the course of this study.

#### Scope of Problem

#### An S-R (situation-response) Inventory of Hostility

was constructed and administered to intercollegiate varsity and junior varsity ice hockey, lacrosse, and soccer athletes at four institutions in New York State during the spring semester of 1977. The inventory related specifically to situations encountered immediately prior to and during the three athletic activities involved. Initially, raters from all three sports, who were randomly selected from the populations sampled, were asked to rate a list of 43 situations intuitively collected with the help of coaches and athletes participating in these sports. The situations were rated according to the criterion: "How much anger or hostility does this produce in you?" A rating on a five-step scale ranging from "none" to "very much" was employed. This rating provided the investigator with a continuum along which the situations were placed. The situations ranged from high to low on a scale of aggression-hostility eliciting. Fifteen situations were selected from this initial list to be used in the S-R Inventory. A similar procedure was used in selecting the modes of response (M-R). However, all 11 modes presented to the raters were used. The final selection of situations incorporated into the Inventory of Attitudes Towards Sport Situations (Appendix C) attempted to take cognizance of the differing categories of aggression presented in the literature: reactive or instrumental athletic aggression, and conformist aggression were differentiated; and consideration was given to the direction of aggressive behavior (extrapunitive, intrapunitive, and impunitive). Once established, the data gained as a result of the administration of the inventory were computed

to locate the sources of behavioral variation.

### Statement of Problem

It was the purpose of this investigation to design an S-R Inventory of Hostility which related to situations encountered in three contact sports. The situations were generalized to encompass all three sport activities, but were adequately specific to relate individually to each of the samples tested. The situations attempted to evince all the possible aggression categories outlined in the literature. The data obtained from administering the inventory to the athletic teams were employed to compute answers to the following important questions:

1. What are the relative contributions of persons, situations, and modes of response to the total behavioral variance in reported intensities of reaction assumed to belong to the aggression-hostility categories?
2. What are the relative contributions of the three simple interactions--persons x situations, persons x modes of response, and situations x modes of response--to the total behavioral variance?
3. What is the contribution of the triple interaction--persons x situations x modes of response--to the total behavioral variance?
4. What is the contribution of the residual component to the total behavioral variance?

## Hypotheses

1. Neither the persons nor the situations will contribute appreciably greater variance to the total behavioral variance than the variances attributable to the three simple interactions--persons x situations, persons x modes of response, and situations x modes of response.

2. The variance attributable to the residual component, as opposed to that attributable to either the main effects or their interactions taken independently, will be an appreciably large part of the total behavioral variance.

## Assumptions of Study

This study was based on the following assumptions:

1. The athletes were able to relate to the investigator a sound estimate of the intensity of their reactions to the situations presented, through the medium of the established modes of response.

2. The athletes were able to relate to the situations as presented, either through direct experience or vicariously.

3. The retest given to the 43 selected athletes did not reflect negativism or boredom on the part of their responses.

4. The reported intensities of reaction to the situations belong to the aggression-hostility categories.

## Definition of Terms

In order to objectify and clarify terms used in this

study, the following stipulative definitions have been derived from the literature.

Main Sources: The individual variables to which variance is attributable, i.e., persons, situations, and modes of response.

Simple Interactions: The interactions of the three main sources, i.e., persons x situations, persons x modes of response, and situations x modes of response.

Triple Interaction: The combined total interaction of the three main sources, i.e., persons x situations x modes of response.

Error: Uncontrolled factor in the inventory.

Residual: The triple interaction and the error or within variance combined. These components will be separated in this study.

S-R Inventory: A situation-response questionnaire which samples, separately, modes of response, situations, and persons. Each item in the inventory, consisting of a response to a specific situation, is measured by the report of a subject on a five-point scale, ranging from "not at all" to "very much."

Reliability of the Total Score: The degree to which an individual holds his rank in a group as a function of the various splits among the items in the inventory.

Reliability of the Situational Scores: As a function of the various splits among the modes of response, the degree to which an individual holds his rank in a group.



Reliability of the Modes of Response Scores: As a role of the various splits among situations, the extent to which rank is maintained within a group by an individual.

Coefficient of Equivalence: The degree to which two measures of the same general trait agree, establishing internal test consistency.

Coefficient of Stability: The degree to which subjects' responses stay consistent over a period of time.

Aggression: The intentional response an individual makes to inflict pain or harm on another individual (31).

Athletic Aggression: The initiation of violent or vigorous entanglement within the realm of sport (31).

Reactive Aggression: Aggressive behavior which has as its goal the infliction of injury on another individual (31).

Instrumental Aggression: Aggressive behavior which has as its goal attainment of a particular reward (31).

Conformist Aggression: Aggressive behavior in accordance with the compliance of significant others (18).

Hostility: An attitudinal response that endures: an implicit response involving negative feelings (or ill will) and negative evaluations of people and events.

Ice Hockey, Lacrosse, Soccer Athlete: A member of one of the above intercollegiate varsity or junior varsity teams who is not participating in any other intercollegiate sport during the time of this investigation.

### Delimitations of Study

The study had the following delimitations imposed on it:

1. The study involved male, college age varsity and junior varsity athletes involved in one of the three contact sports.
2. One method of data collection--self-report measure--was used.

### Limitations of Study

Limitations inherent in this study includes:

1. The results may be generalized to collegiate athletes participating in contact sports.
2. Self-observation and observation of behavior techniques of data collection were not used. Thus results obtained using such techniques cannot be compared to the results of this study.

## Chapter 2

### REVIEW OF RELATED LITERATURE

For the purpose of this study, the review of related literature had its concentration in the following five areas: (1) prolegomena to sports personality research, (2) personality research paradigms: consistency versus situational specificity, (3) person-situation interaction paradigm, (4) ANOVA psychology: interactionist position, and (5) summary. The person-situation interaction paradigm literature had its concentration in the classical interactionist literature, and modern formulations. The ANOVA psychology area was further subdivided into limitations of interactionist research, and criticism of interactionist research.

#### Prolegomena to Sports Personality Research

The concept of personality, however defined, has been one of the most extensively analyzed areas in psychology. Indirect evidence of the interest in personality lies in the wealth of research literature utilizing personality as a variable. For example, in the reviews of the general area of personality presented in the Annual Review of Psychology over a 10 year period, from 1967 to 1976 (59,68,74,75,96,101, 138,141,145,151), over 3,000 references were cited by the authors.

The interest in personality has not been restricted

solely to clinical and experimental psychology, however. Over the past years, those concerned with athletics--physical educators, coaches and sports psychologists--have increasingly turned their attention toward the personality dynamics of sports participation. The original impetus for research in this area undoubtedly was caused by man's inability to adjust to the complexities of sport and society, or by physical educators, coaches and other seeking to justify their existence in the academic world (98). A number of reviews have appeared in the physical education and psychology of sport literature summarizing current research concerned with the relationship of personality to athletics (11,13,22,24,29,30,39,71,98,115,116,126,129,140,146). Martens (115) has identified 202 references to sport and personality, excluding unpublished master's and doctoral theses and studies, which have examined the relationship between specific personality characteristics and motor behavior or physical fitness. In fact, of these references, all published between 1953 and 1973, it was determined that one in five papers was a review.

And, while the majority of these reviews have appeared only recently, this is no reflection of physical educators' and sports psychologists' longstanding interest in personality. The reviews cited above deal with investigations published since 1960. Two comprehensive reviews prior to this date were published by Cofer and Johnson (13) and Scott (140) and related to investigations in sports personality undertaken as early as 1941 (94). As Kroll (29:349) has pointed out, "the

profession of physical education has long been aware of the importance of personality variables in its conduct of educational physical activity programs." However, research findings relative to the study of personality and physical performance reveal a mosaic of contradictions and an atmosphere of prevailing confusion. Husman's (98:69) statement that, "our research should be based on some theoretical concept, instead of continuing to probe in the dark with inadequate tools, number of subjects and poor designs," is germane to the research to date.

From 1969 to 1974 a number of significant papers (29,47,146,159) have drawn attention to the fact that personality evaluation and studies in sport personality have been erroneous, predominantly because of methodological problems. The analyses of the research undertaken to date all make the same conclusion. There still seems to be very little known about personality as related to physical performance.

Ryan (162), concerned with the direction being taken, pointed out the contradictions between the questions being asked and the methodology being adopted to answer these questions. He further indicated that no advance has been made in knowledge of personality and physical activity for the past 15 years.

Kroll (29:362) added strength to Ryan's statement in pointing out that:

Any honest appraisal of the work in athletic personality must conclude that the picture is unsettled. Only clinical interpretations have been able to come up with anything approaching a definite conclusion while studies

with objective measures of personality continue to offer conflicting results.

In defense of the last decade of sport personality research, Straub (56) stated that more is known about the psychological factors underlying performance, and implied that there is now a better understanding of the athlete's needs, motives, aspirations, and desires. Antithetical to Straub's opinion is Rushall's (47:168) conclusion that, "a relationship between personality variables and physical performance does not appear to exist." Rushall (47,48,49,160) has made clear his reservations as to the importance of personality in athletic performance.

Before an examination of the research in sports personality can proceed effectively, it is essential to clearly understand what is meant by the term sports personality and what it actually encompasses. According to Martens (116:14), "personality is an abstraction or a hypothetical construction from or about behavior." The objectives or goals of the field of personality are to obtain valid information and reliable empirical data of behavior in order to understand and ultimately predict behavior. The culturally directed importance of achieving excellence in athletics might be facilitated by predicting athletes' psychic make-up or competitive behavioral patterns. Sports personality, then, is generally that branch of total personality research that places an emphasis on the understanding or prediction of behavior in a sport context.

An examination of the research in sports personality will reveal that two goals or purposes have been operative.

Martens (116) outlines these as being:

1. The determination of the role that sport plays in personality development or change.
2. The determination of the influence of personality on sport performance.

The emergence of such goals within the realm of sport psychology has been due somewhat to the acceptance that participation in sport has some kind of positive psychosocial value and furthermore, increased knowledge of an athlete's behavior may be of value in improving performance. These two goals are inseparably interwoven and the knowledge gained of immense value.

The above goals encompass other more specific goals outlined by sport personality researchers (11,21,29,47,98,162). Horsfall (157) has provided a succinct and plenary account of the goals of sport personality research, the current status of such research and the inherent problems facing further research, on the basis of past experiences and conclusions.

In an attempt to eliminate some of the confusion in sport personality assessment, and to possibly moderate the interpretation of unsettled research, Kroll (29) has suggested several possible hypothetical models that could plausibly be tested.

1. There may be a set of personality factors which prompt individuals to elect participation in a particular sport.
2. No pattern exists which is associated with initial

entry into a sport, but either by modification of existing and alterable personality factors, or attrition of inappropriate patterns only those possessing suitable or alterable patterns will be successful.

3. Both neophytes and successful veterans possess dissimilar and nondiscriminate patterns.

4. A similar pattern may exist at entry, but participation and attrition results in a dissimilar and nondiscriminant pattern among successful veterans.

5. Opposite discriminatory patterns may be demonstrated in untried novices and successful veterans.

Although support for each of these five models is scarce, Kroll (29) implies that evidence from a parallel search for physical success prerequisites and distinguishing characteristics suggest that model possibilities other than the more attractive ones (models one and two) merit careful consideration. Kroll (29:360) states that, "bland acceptance of any preconceived and poorly verified paradigm can be disruptive to productive research efforts." Husman's (98:59) review displayed the vast array of conflicting results and implied a sort of predilection to models one and two by his statement that "such conflicting evidence . . . is undoubtedly due to instrumentation and methodological inaccuracies."

A number of reviews (11,17,29,162) have attempted to isolate the problems involved in sport personality research. Martens (116) presented a complete breakdown of the errors that are prevalent in sports personality literature. These



errors include methodological, interpretative, and conceptual problems. After an appraisal of the methodological and interpretative errors, the following area--personality research paradigms--will have its concentration in what is considered by many (29,146,155) to be the most outstanding problem, namely, the conceptual problem.

Much of the research in sport personality assessment has floundered upon methodological problems that could have been overcome with insight. Such problems include the inability to clearly operationalize important variables, the employment of poor sampling procedures, and the use of inappropriate statistical analyses (116). Morgan (126) proposed that the lack of rigorous definition for the independent variables has contributed to what he referred to as the "general confusion" in sport personality assessment. Specifically, Morgan mentioned the failure to control for the multiple group participation (i.e., is an athlete that wrestles and plays lacrosse an individual versus team versus combative versus non combative sport participant?) and the failure to adequately define group affiliation (i.e., should the athlete that practices with a team but does not play be classified as a participant?).

Although rich sources have accumulated for guiding statistical manipulations of obtained personality data, the problem of how to secure adequate and/or appropriate data persists. The appropriate choice of statistical analysis is dependent on the researcher's conceptual model of personality,

such as, whether or not he believes that certain aspects can be separated from the individual's total personality. ANOVA psychology, however, is gradually diminishing the errors that occur through the use of less appropriate statistical tools (e.g., multiple t tests). Application of multivariate statistical analysis has further been emphasized (103,104,115). Martens (115:173) also considers this problem:

A final methodological concern is the predominance of research employing a univariate approach. Man has intuitively known, and is rapidly learning from the behavioral sciences, that human behavior is complex and not based on single cause and effect relationship.

Some attempts have been made to rectify the weaknesses in methodology. Kroll and his co-workers (102,103,104) have demonstrated a rigorous experimental design and an imaginative application of statistics in their investigations of personality and athletics. For example, Kroll and Peterson (104), in an investigation of personality characteristics, compared the utilization of univariate, as contrasted to multivariate analysis, as two statistical analytical methods and demonstrated the feasibility of the latter approach as a powerful tool for analyzing personality profiles.

A fourth, and probably the major problem in most sport personality research, has been the use of inappropriate measures of personality dispositions. Much of the research has used objective inventories as a baseline assessment of personality. Selection of such personality tests is usually based on convenience to the investigator rather than the

underlying conceptual structure of the test. Smith (146) reports that in slightly over a decade, more than 30 tests purporting to measure personality have been reported in the Research Quarterly. Singer (53) spoke of four inventories as those most often being used by investigators dealing with athletic personality: The Cattell Sixteen Personality Factor Questionnaire (16PF), the California Psychological Inventory (CPI), the Minnesota Multiphasic Personality Inventory (MMPI), and the Edwards Personal Preference Schedule (EPPS). These have been useful in considering communalities and in examining personality as a variable in sports participation. However, these tests, although prestigious and well constructed (146), are not unanimously accepted by theorists as "the" all-inclusive tests of personality. Smith (146) lists some of the criticisms which have been leveled at the nonprojective trait-oriented tests as being: trait profiles do not fully describe and account for the "whole" personality, they lack power in interpretation of the meaningful organization and interrelationships between facets of the personality, and that the factor scales are not independent. It is more important to note that these personality tests all embody the trait theory as their main premise. Rushall (160) implies that the general-trait measurement model, encompassed by its psychological theory is losing ground in its acceptance and proselytization by psychologists (e.g., Klein, Barr, and Wolitzky (101)).

In conclusion, Butcher (10:13) states that:

. . . in this era of remarkable progress in science and technology, it is sobering to think that our most widely used instruments for personality assessment were published

20 or more years ago.

Three interpretative errors are identified by Martens (116) as: inferring causal relationships from purely correlational evidence, reporting generalizations unsupported by empirical evidence, and at present an isolated problem, clinically assessing personality from prognosis of success and remediation of any observed deficiencies. These research errors can and must be overcome if sport personality assessment is to be considered worthwhile. Methodological and interpretative errors are relatively easy to correct. The latter requires the simple cessation of such practices, while the former, requires the inclusion of more powerful statistical procedures and careful sampling of subjects.

Magnusson (108,109) has pointed to the important distinction between personality theories and their measurement models. This most problematic methodological aspect of personality research is the assessment of personality dispositions. This problem is closely related to the conceptual difficulties which face sports personality and will be dealt with as such.

Before proceeding to the "conceptual problem" area, in reference to the controversial issues regarding the proper scientific paradigms, orientations, or models used for studying personality outlined by Martens (116), it may be a propos at this point to review the relationship between sport and aggression.

Few psychological variables have more importance for

athletes than that of aggression. Competition is inherently frustrating, since sports are designed to frustrate and confuse the opponent. Winning usually involves mental injury to an opponent, and sometimes physical as well. That is, a team cannot succeed without beating their opponent. If a team does not expect to win, there will be less frustration, thus perhaps less aggression (98). Psychologists differ in their analysis of competition only in detail, but all generally agree as to the essentials. These involve:

- (1) Two or more units, either individuals or groups, engage in pursuing the same rewards, with (2) these rewards so defined that if they are attained by any one unit, there are fewer rewards for the other units in the situation. The losing unit is clearly frustrated (6:178).

Two fundamental views of aggression are widely supported, the instinctive view as advocated by Lorenz (36), Storrs (55), and others and the learned view as originally proposed by Dollard and others (15), and modified by Berkowitz (6). Lorenz (36) reaffirmed the instinctive basis of aggression, although giving environmental factors an important role in the occurrence of aggressive behavior by referring to "eliciting cues" of "releasers" which "trigger" the instinctual aggressive tendencies. Singer (54) considers this view the most widely accepted view of aggression, even though there is a lack of empirical evidence to support it.

The second major view of aggression attributes greater significance to learning and situational factors than to instinctive processes; aggression results from the frustration or the block of a goal directed response. Berkowitz (6) has,

for the most part, rejected the first view, and has modified somewhat the hypothesis of Dollard and others (15). Berkowitz's (6) adaptation of the frustration-aggression hypothesis has gained considerable empirical support. According to Berkowitz, anger resulting from frustration does not lead directly to aggression but creates a readiness for aggressive acts.

Suitable aggressive cues (associated with either the present or previous anger instigators) are necessary for aggressive behavior to occur. The strength of the aggressive cue value and the degree of readiness jointly determine the strength of aggressive response.

Since hostility may be inferred from certain kinds of aggression, the two may be confused. However, not all hostile responses are necessarily aggressive, since at times responses are not verbalized in the presence of the opponent. On the other hand, not all verbal aggression implies the presence of hostility (89). For example, in the course of the game an attack that is contained in a string of oaths and curses is usually associated with rage but not with the more enduring ill will of hostility. The athlete who "blows his top" by swearing at an opponent is less likely to hold a grudge after the game. Most instrumental aggression has no hostile element; the opponent is not hated. Thus hostility can occur in the absence of aggression, and aggression can occur without hostility.

Hostility is by implication a dispositional response, i.e., it may lead to aggression. Whether or not aggression occurs,

however, is related not only to the intensity of the hostile response, but also to the habit strength of aggression. The relationship between hostility and aggression depends in large part on whether they are initially elicited by the same stimulus.

Although these two aspects of behavior--aggression and hostility--are often clustered together, they may be treated separately. However, Endler and Hunt (84) considered these two aspects as synonymous, and generally subsumed hostility into the aggressive behavioral category. Time and space does not warrant further discussion of either views of aggression or their respective modifications.

Regardless of which theory of aggression is adopted, when the motivation for an aggressive act is assessed, it is possible to differentiate overall aggressive behavior into certain categories. These interrelated categories may depict certain qualities of both violence and vigor in an athletic context.

Layman (30:328) provides the following definitions:

Reactive aggression involves a goal-response . . . the injury of the person or group of persons against whom the attack is directed. The person (group) is perceived as the "enemy" who has been the agent of frustration, the source of some noxious stimulus, or the originator of a threat of frustration or unpleasantness of some kind.

Instrumental aggression is attack in which the primary goal is not the injury of the enemy, but attainment of a reward. Instrumental aggression does not involve anger and is not a response to frustration or noxious stimuli.

Fromm (18:207) defines conformist aggression as:

. . . comprising of various acts of aggression that are performed not because the aggressor is driven by the desire to destroy, but because he is told to do so and considers

it his duty to obey orders. . . . Obedience as a consequence of the need to conform will in many cases mobilize aggressive impulses that otherwise might not have become manifest.

Whether aggression in contact sports is primarily reactive, instrumental, and/or conformist in nature, as well as whether its occurrence can best be understood in terms of an instinctual or situational theoretical position, are basic questions to the understanding of the phenomenon. However, they are beyond the scope of the present study.

Olweus (44) considers that both situational and habitual determinants of an aggressive response must be taken systematically into account. He implies that "interactionist" position (Zigler (58)) in relation to human aggression, from the basis of mainly animal research, must be adopted. This position is supported by Berkowitz (64), Feshbach (89), Moyer (127) and others.

The assessment of aggression in sport is an important but difficult task that suffers from several specific problems, one of which is person perception. Another problem that confuses the assessment of any personal construct involves the presence of several levels of functioning of that characteristic. Holtzman (95) has identified four levels for the "hostility" construct. This investigator has chosen to use the second or "inferred conscious self" level, which is to be assessed using a non-projective S-R (situation-response) personality inventory.



Personality Research Paradigms: Consistency  
Versus Situational Specificity

The general reference to "conceptual problems" is used in reference to the dilemma of what should be regarded as the appropriate paradigm for sports psychologists to adopt. Two such personality paradigms have been in rivalry with each other over the past decade in the personality literature. One paradigm is the trait or dispositional approach, and the other is the situational approach, supported by the advocates of social learning theory, among others.

For years personality theorizing has been dominated by the trait assumption that there are pervasive cross-situational consistencies in an individual's behavior. Sport personality research has also adopted this position wholeheartedly. Trait theory advocates stable intra-organismic constructs such as "traits," "psychic structures," or "internal dispositions," as the main determinants of behavioral variation. Trait psychologists, then, search for consistencies in behavior across situations, although, they do not dismiss the effect of the situation completely.

Three possible meanings of behavioral (reactions) consistency have been distinguished by Magnusson (1981, 1991). Relative consistency--"the rank order of a set of individuals across situations" (1981:7)--has been examined in most of the empirical studies relevant to the consistency-situational specificity (person by situation interaction) issue.

A third and more fundamental meaning of consistency--

coherence--is adopted by Magnusson (109). Coherence refers to behavior that is inherently lawful and hence predictable without necessarily being stable in either absolute (another meaning distinguished by Magnusson) or relative terms. Coherence means that the individual's pattern of stable or changing behavior across situations of different kinds is characterized by the individual and may be interpreted in a meaningful way within the interactional paradigm (16,81,107, 108,109). For example, an athlete behaves differently in various sport situations, but the rank order of his behavior across a number of different sport situations may still be predictive. An investigation of the relative consistency across dissimilar situations has been conducted in sport (153, 157), similar to empirical studies undertaken elsewhere (82, 83,86).

In sport personality research, it has often been considered that athletes are characterized by a unique consistency of behavior in the athletic event itself. Characteristics such as aggression, anxiety, assertion, and dominance appear to be "consistently" evinced during competition. This cross-stability of rank orders of individuals is a central issue for empirical personality research within the trait measurement model (61).

Straub (56), an ardent advocate of "Cattellian" theory, considers that the attack on factor theory techniques (17,38, 53,60,63,80,97,116,162) has "grossly overstated the case against trait psychology" (56:179). Straub (59:180) further

states that:

Proponents of situationism and interactionism fail to mention that in some cases the trait approach to personality does result in powerful predictions of behavior. In the area of delinquency for example. . . .

It would appear that Straub has not considered the trap sport psychologists often fall into, that of the value of non-sport investigations. Rushall (160) brought to attention the concept of practical significance in sport personality research.

Not surprisingly, the trait view of behavior has also been found lacking in recent sports studies employing the S-R Inventory approach (153,157).

Antithetical to the trait view of personality is situationism, which has risen to prominence because of the popularity of behaviorism. As a Skinnerian model of man, situationism rejects the role of organismic or intrapsychic determinants of behavior. The situationists consider that consistency of behavior is a function of the specific response situation, not of the underlying consistent generalizable personality dispositions of the athletes themselves. In order to understand and predict behavior in a sport context, those who advocate situationism consider it paramount to have a greater understanding of the psychological (and physical) characteristics of the specific response situations in athletic events.

A basic issue in the trait consistency-situational specificity debate is whether behavior can be attributed to some underlying causal mechanism (i.e., a trait, as for

example "aggression") or whether a summary label has been applied to a specific observed behavior in a specific context (118). Mischel (38,118), Sells (142), and Wallace (149) support the latter view; individual differences in behavior are attributable to specific response potentials which are activated by specific situations. Their model provides for trans-situational differences in behavior within individuals.

Mischel (118) provided a strong criticism of trait theory, and proposed an alternative approach to the study of personality based on a social learning model. As indicated previously, Mischel (38) would prefer to attribute individual differences in behavior to specific response potentials which are activated by specific situations. Mischel (118) lists five categories of person variables which contribute to the individual differences in response potential. Inasmuch as there are wide individual differences in these person variables, there may still be cross-situational consistency among individuals in certain situations. This illustrates the case where the nature of the behavioral situation is such that it has a consistently significant effect on all individuals. Mischel (118:270) noted that:

Psychological "situations" and "treatments" are powerful to the degree that they lead all persons to construe the particular events the same way, induce uniform expectancies regarding the most appropriate response pattern, provide adequate incentives for the performance of that response pattern and instill the skills necessary for its satisfactory construction and execution.

Competitive athletics contains numerous instances where the "psychological situation" or "treatment" is

sufficiently powerful, when the stimulus event is of sufficient magnitude that relatively consistent behavior is displayed by the total group (11). Some situations encountered in an ice hockey game, for example, are similar enough to produce similar aggressive reactions from all team members. The range of individual differences is reduced and heightened aggressiveness is demonstrated universally in all ice hockey players when their one-on-one encounter is isolated and viewed by all coaches and teammates. In situations, as those found in a competitive sport, when the stimulus event(s) is of sufficient magnitude, individual differences in behavior are relatively small. This fact in itself might be one reason why physical educators, coaches and sports personality researchers hold to the position that there are identifiable consistencies in personality characteristics among various athletic groups.

Rushall (48), and Rushall and Siedentop (49) have attempted to apply situationism to behaviors in the sport settings, with some success. They have developed a Skinnerian application of situationism to sport, in utilizing applied behavioral analysis. However, one should not confuse the application of situationism in applied settings with the model used to describe personality.

Those who advocate the situationist position do not totally refute cross-situational consistency or generalizability of behavior. However, it appears that there is no reason to assume that there should not be wide differences among athletes in the person variables, i.e., it is expected that

behavior will differ trans-situationally within individuals.

Block (65:210) has suggested some conceptual reasons for the apparent inconsistency of personality including:

(a) the mixing of behaviors of different levels of salience, (b) the failure to recognize the effect of environmental factors, (c) the comparison of behaviors mediated by different underlying variables, and (d) the failure to specify or to recognize the bounds within which the posited relationship may be expected to exist.

Wallach and Leggett (150), summing up the controversy over the extent to which behavior is cross-situationally consistent versus situationally specific, feel that it is a pseudo-controversy, due to erroneous assumptions. They view the error as assuming that consistency of behavior lies upon finding evidence for traits of dispositions, which in their opinion are only "presumptative indicators of an underlying hypothetical entity of some kind" (150:612).

Bem (63) reiterates Mischel's (38:117) former position and supports the above contention that although personality theories have been dominated by the assumption of cross-situational consistencies in behavior, there is little empirical support for this position. The empirical results with respect to cross-situational consistency have rarely yielded validity coefficients for measures of personality traits above .50 and are typically about .30, accounting for about 10 percent of the relevant variance, a trivial amount (38,82,97, 117).

Mischel (117:1012) has indicated that "it may be useful to distinguish between consistency in various types of human activity." There is evidence for cognitive and intel-

lectual cross-situation consistency and stability over time. However, with respect to social behavior and noncognitive personality characteristics the trans-situational consistency is not very high. Argyle and Little (61) have provided evidence in favor of situational factors with respect to social behavior, as too have Endler (79), Endler and Shedletsky (88), in social conformity. Mischel (38) has reviewed the evidence in favor of situational specificity for such character traits as aggression, attitudes to authority, conformity, dependency, rigidity and many other noncognitive personality variables. It appears from these results, and those of Endler and his co-workers (83,85) in regards to anxiety and hostility, that one cannot generalize from one trait to another with respect to consistency.

Mischel's (118:254) social learning reconceptualization of personality is a denial of the widely held view that "social behavior theory, especially in its emphasis on the discriminativeness ('specificity') of behavior, implies a 'personalityless' view of man," although, the general tenor of this present view is that traits are still not defensible concepts.

Bowers (66) provided an extensive critique of situationism in terms of its metaphysical, psychological, and methodological assumptions. He claims that although situationism has served as a necessary and warranted corrective to a trait approach, it has gone too far in the direction of rejecting the role of organismic or intrapsychic determinants of behavior (e.g., Bem (63).) In a summarization of the results

from 11 articles, Bowers (66) found that neither the situation nor the person per se were the main determinants of behavior. Thus, over reliance upon situationism has fastened our attention upon behavior change, so that behavioral consistency is overlooked. Bowers (66) suggests that behavioral consistencies are more apt to emerge when correlational or interactional analyses are applied. By these analyses, there is behavioral consistency without a trait explanation of it.

The primary conclusive factor to be ascertained from Bowers' review is that approximately twice as much behavioral variation was accounted for by the interaction of the person and the situation as from either of them per se. Demonstrated by statistical analysis, this interaction effect would seem to be in line with reason.

It would appear, then, that trait psychology has over-emphasized internal consistencies of behavior to the neglect of the environment (situations), while situationism has held the environment at the expense of individual consistency. In the following sections, a case will be developed for a construct of mediation, the interaction paradigm.

#### Person-Situation Interaction Paradigm

As a viable alternative to both the trait view of personality and situationism, interactionism views man's behavior as a product of both the situation and the person--an advocacy of "mutual involvement." The interaction paradigm considers situation and person variables as co-



determinants of behavior without specifying either as primary or subsidiary. Instead the primacy of situation and person variables is dependent upon the sample of people studied and the particular situations they are in.

Olweus (43) distinguished four different meanings of the terms "interact" and "interaction." These terms have been used in two different ways: (a) in the statistical sense of the word, reflecting interactions of the main factors within a data matrix (cf. Endler (80)), and (b) in a model of behavior integrating person mediating variables, person reaction variables, and situational variables to describe and maintain itself. Overton and Reese (45) differentiate these two models of interaction as "mechanistic" interaction and "dynamic" interaction (80). The mechanistic meaning of interaction is connected with a mechanistic measurement model for interactional behavior. This model implies a distinction between dependent and independent variables and the assumption of an additive, linear relation between situation and person factors. The dynamic model, stresses an interaction process in which persons and situations form an inextricably interwoven structure. This model of behavior implies that the traditional distinction between dependent and independent variables may not be very useful. Endler (80,81), supports the mechanistic approach as a viable model although clearly, it is not appropriate for studies of the dynamic interaction process within the interactional model of behavior.

Magnusson and Endler (37), in differentiating the

two models--mechanistic and dynamic--postulate four different subcategories of mechanistic interaction, which may be investigated in reference to reaction variables. In statistical terms, significant interaction could be observed between persons and situations; persons and modes of response; situations and modes of response; and a three-way matrix for persons, situations, and modes of response.

Both Endler (80,81), and Ekehammar (76) have stressed the close association between interactionism and the variance components approach. It has been contended that only the development of this technique has made it possible "to put the interactionist theory to a more direct, empirical test (76:1044)." Moreover, Ekehammar (76:1034) stated that:

The empirical evidence supported almost without exception the interactional view, which means that the relative magnitude of the Person x Situation interaction variance was usually greater than the relative magnitude of the person or situation variance.

Thus, it appears that the link between this interactional position and the variance component approach, in particular the relative magnitude of the person by situation interaction variance is quite strong. This link will be further elaborated upon in the following section.

According to Endler and Magnusson (16:4), the basic elements of the person by situation interaction model can be summarized as follows:

1. Actual behavior is a function of a continuous feedback process between the individual and the environment.
2. The individual is an intentional active part of this

interaction process.

3. On the person side of the interactional equation ( $B=f(P \times S)$ ), cognitive factors are the essential determinants of behavior although emotional factors cannot be discounted.

4. On the situation side, the psychological meaning of the situation for the individual is the crucial determining factor.

On the issue of behavioral consistency, it is suggested that there is no need to look for stability across situations, but to seek out the specific ways in which individuals adjust their behavior to suit situational demands. It is necessary to look for the ways individuals react to classes of situations that have a personal meaning for them. The reason this strategy is important is that one of the basic assumptions of interactionism is that individual behavior is more similar across situations that are perceived and interpreted as similar by the individual (17).

In relation to sport personality research, it is clear that interactionism is a viable approach. Martens (116) expressed the concern about the trend in research to swing from the trait paradigm to the opposite extreme--the situational paradigm. In the light of this trend he wrote:

Because the interactional paradigm is conceptually unchallenged and is empirically warranted, sport psychologists can avoid situationism and proceed directly to the development of interactional paradigms (116:22).

#### Classical Interactionist Literature

By reviewing different classical theories of psychology,

it is argued that the modern interactionist conceptualization is not new in personality psychology. Ekehammar (76) provides a detailed review of the interactional position from a historical perspective.

Probably one of the first attempts towards an interactionist conceptualization was made by Kantor (25,26). In his consideration of the "mutual interaction of the organism and the environment" (27:369), and in relation to the unit of study, Kantor (26:92) stated that it should be "the individual as he interacts with all the various types of situations which constitute his behavior circumstances."

Koffka (28), although involved primarily with perception rather than personality, made a clear distinction between the "geographical" (physical) and "behavioral" (psychological) environment and postulated that the latter was a result of the interaction between the physical environment and the organism.

Lewin (32,33,34,35) also emphasized the physical psychological environment distinction. The psychological environment was stressed, however, rather than the physical. A significant factor in Lewinian theory was the conceptualization of the situation as a whole. With respect to the measurement of the components in the individual-environment system, Lewin (33) suggested that the same conceptual dimensions should be used in order to permit quantitative comparisons. This idea has been used in recent ANOVA applications to interactional data.

Angyal (3) went further than Lewin in stressing the individual environment systems as an inseparable entity. Expressed in modern interactionist terminology, the position seems to imply that behavioral variance can be explained not just by the variance of any single component but only adequately by their interactions.

Murray (41), together with Lewin, has often been regarded as the theorist paying greatest attention to the issue of individual-environmental interaction (Pervin (130)). A discerning feature of Murray's theory was that the relevant characteristics of the person were expressed in terms of needs, and those of the environment in terms of press, which stood for need satisfaction and need frustration. Murray's detailed but tentative classificatory dimensions, allowed for individuals and situations to be described in the same dimensional system. Lewin (33) made a similar point, but was by no means as explicit about which constructs to employ. Murray (42) stressed the reciprocity of the person and situation in essentially the same way as Lewin and Kantor, (" $N \rightarrow P$ " and " $P \rightarrow N$ "), although in terms of needs (N) and press (P).

The Biosocial Theory of Murphy (40) can also be seen to lean towards an interactionist view. Murphy depicted the organism not as an encapsulated unit, but rather as an organizing point in a field. Based upon this conceptualization, he proposed that the man-world relation or organism-environment field should be studied. Further, Murphy (40:867-891) gave a good comparative discussion of the situationist versus the

field theory (interactionist) position. However, a "deficiency" in Murphy's biosocial theory was the lack of environment--physical contra psychological. This distinction was clearly made by Koffka, Lewin, and Murray.

Rotter's (46) social learning theory approach to personality overcomes the deficiencies of Murphy's (40) theory. Rotter coined the term "meaningful environment" in reference to the significance of the environment to the individual. Rotter pointed out the need for an objective description of the situation if psychology was to know the meaning of situations for individuals, and thus, paved the way for the analyses of situations (90,107,110,142).

Jessor (99,100) firmly indicated that psychology should be defined in terms of the organism-environmental interactions when he stated, "Our definition of psychology, therefore excludes the study of organism or physical environments per se, as behavior may not be referred to either alone" (100:173). He noted like Rotter (46), that personality theorists must take into consideration the development of an adequate psychological data language to describe the environment. Jessor (100), therefore, argued for a phenomenological personality theory, employing constructs referring to the psychological environment.

Pervin (130) was also concerned with the problem of an objective description of individuals and situations. Without categorically providing a solution to the problem, he concluded that the complexity of human behavior makes it

probable that future research would be conducted within a "trans-situational framework." This framework, according to Pervin (130:64), stands for the view that "the organism and the environment are conceptualized to influence one another as part of a total transactional field."

Interactionism, then has a rather rich history. It can be traced back to the works of Kantor (26,27) and Lewin (32,34), and is, furthermore, advocated in many of the succeeding classical works.

### Modern Formulations

Whereas classical interactionist views were usually formulated within personality theories, more recent conceptualizations have been in the absence of such elaborate theories, or at least without reference to any such theoretical standpoints.

The "principle of interaction" was clearly stated by Sells (51,142,143) in the middle of the 1960's. He seemingly was able to derive a formulation of the problem, at least theoretically. The significance of his formulations lay in an understanding of the interactionist concept as it is known today. This understanding can be clearly seen in Sells' (142) conclusions, that the theoretical base can only be advanced if the variance attributable to situational factors is isolated, and if measures of the situation are obtained. Sells (142) developed a classificatory system based on the ideas of Sherif and Sherif (52), which confines

Sells exclusively to the physical-social dimensions, contrary to most other interactionists.

An emphasis upon a behavioral approach to interaction was also characteristic of Arnoult (4), Barker (5,62) and Cattell (12,69). Barker's (5) approach to analysis of situations was to use mainly socio-physical characteristics and to describe the situation in so-called "behavior settings." Cattell (12,70) dealt with both the socio-physical and psychological aspects of the situation in the same framework. According to Cattell (12), the classification of situations on the basis of their psychological meaning is paramount, but such dimensions should also relate to socio-physical situation dimensions.

Abelson (1:245) noted the serious neglect of situational variables, and suggested that "the locus of appropriate factorial investigations should shift from the individual-difference level to the environment-situations level." Abelson hoped that assessment and psychometric methods would be developed to incorporate a person-situation interaction paradigm.

Vale and Vale (147) concluded that a successful psychology must come to grips with the problem of the interactions of organisms and environment. They suggested a research paradigm in which analysis of variance should be exploited. In consideration of the problems in personality research they stated:

. . . if we are genuinely convinced that behavior is a product of the organism-environment interaction, then



we must equip ourselves conceptually and methodologically so that relevant data may emerge and find proper interpretation (147:1093).

During the recent phase of development of an interactionist psychology, some attempts have been made to summarize and integrate interactionist formulations and research. Jessor's (99,100) contributions mentioned earlier may be viewed as an early attempt.

Pervin (130) reviewed relevant empirical research and theoretical propositions of the interactionist position. However, whereas Pervin did not provide much direct empirical evidence, this deficiency was overcome in Bowers' (66) defense of the interactionist view.

Bowers (66) criticized situationism from a philosophical and methodological, as well as an empirical angle. Bowers cited 11 empirical studies which employed analysis of variance and bore directly on the person-situation interaction issue, as empirical evidence against situationism. The evidence categorically supported an interactionist position. The statistical interactions implied that the major determinants of behavior are in the individual's perception of the situation and not the environment per se. The main point in Bowers' (66:328) cognitive interactionism was that:

. . . the situation is a function of the observer in the sense that the observer's cognitive schemas filter and organize the environment in a fashion that makes it impossible ever to completely separate the environment from the person.

Argyle and Little (61) came to a similar position from a critical examination of the trait view. They argued that

one important way in which personality theories differ is in the amount of behavioral variance, "which they hypothesize can be attributable to individuals, situations, and to interactions" (61:2). Four types of variability are related to different types of personality models: (a) constant patterns of behavior; (b) trait dispositions; (c) individual cognitive systems; and (d) a series of unrelated stimulus-response links. The authors stated that (a) and (b) were nonapplicable to the area of social behavior, whereas the other models received some empirical support. Based upon empirical research, Argyle and Little (61) concluded that the statistical interactions may be explained by the fact that individuals construe or perceive the same environment differently.

Mischel's (118) "cognitive social reconceptualization of personality" is a distinct orientation towards a cognitive psychology. The person-situation interaction issue was penetrated, and was totally congruent with his own emphasis on the "idiosyncratic organization of behavior." Like Bowers (66), Mischel (118) linked the important statistical person x situation interactions to the individual's constructions of the situations, thus implying a commitment to a dynamic interactionist view.

Both Mischel (118) and Bowers (66) emphasized the person as a function of the situation, as well as the situation a function of the person; the latter through the person's cognitive construction of the situation and active selection and modification of situations.

Mischel (118) has provided a new penetration into the person-situation issue. His review of empirical results did not support the personality assumption of trans-situational consistency; on the contrary, it supported inconsistency or "behavioral specificity" as the rule rather than the exception, at least for noncognitive personality dimensions.

Alker (60) initiated a debate criticizing Mischel's thinking and concluded among other things that Mischel ignored the person-situation interactions and that behavioral specificity was not incompatible with the view of "intrapsychic consistency." Wachtel (148) expressed similar views stating that inconsistent phenotypic behaviors can be explained by a person's genotypical psychic structure.

Bem (63) defended Mischel's arguments in opposition to Wallach and Leggett (150), who provided empirical results supporting cross-situational consistency. Finally, Endler (81) argued that the Wallach-Leggett results supported neither the specificity nor the consistency positions.

One may conclude from the above debate that all of the theoretical views agree on the consistency of overt behavior. However, the trait position implies that stable, psychic constructs (not linked to the environment) can account for these inconsistencies, whereas the other views imply that such constructs are not empirically validated and do not improve description or prediction of behavior (76).

The past decade has seen some important discussions of the interactional issue in connection with some rather

extensive empirical research projects, bearing directly on the problem of person-situation interactions and behavioral consistency. At least four relevant projects can be mentioned, connected with the names of Endler and Hunt (80,81,82,83,84, 86), and Magnusson (107,108,109,110,111,112,113,114), Moos (119, 120,121,122,124,125), and Raush (132,133,134,135,136).

Raush and his co-workers were probably the first to base interactionist formulations on direct empirical research, employing appropriate methodology. Applying observation of behavior, Raush, Dittman, and Taylor (134) conducted a study with six hyper-aggressive boys in six different settings. The results of this study lent support to the interactionist position as the situations were seen to account for approximately three percent of the total variance and persons only two percent, whereas approximately 11 percent of the variance was attributed to the interaction of the two main factors. Similar trends were reported in a further study by Raush, Farbman, and Llewellyn (136) conducted a year later.

In a series of studies, Moos (120,121,122) employed not only observation of overt behavior techniques, but also self-observation and ratings in the presence of the situations that were rated. For example, Moos (122) employed a sample of 10 professional psychiatric hospital staff across nine situations in a self-observation study. The results showed that persons accounted for only seven percent and situations 13 percent of the total behavioral variance. Similar findings were reported in subsequent studies conducted by Moos and others (119,124).

The Endler and Hunt (82,83,84,86) studies have probably been the most important and well known empirical contributions in the recent phase of interactionist psychology. Endler, Hunt and Rosenstein (86), in 1962, developed an S-R Inventory of Anxiousness and administered it, along with several other instruments, to several samples of subjects. The inventory employed a sample of 11 situations and 14 physiological modes of response. This investigation aimed at testing the relative consistency hypothesis within the context of the trait measurement model, and was, furthermore, focused upon the importance of situational factors in trait ratings as the name of their main research instrument ("S-R Inventory") might suggest. A three-way analysis of variance (ANOVA--comparison of mean squares) in the responses to the questionnaire, demonstrated that the modes of response contributed most to the overall variance, with situations next, and personal differences a distant third. In one particular sample (Penn State), the situations contributed over 11 times more variance than did individual differences among subjects. The interactions of the main factors were also seen to be highly significant by customary statistical tests. These results caused Endler, Hunt, and Rosenstein (86:29) to adopt a situationist standpoint, stating:

The predominance of situational variance over person variance clearly supports the contention of the social psychologists that knowing the situation is more important for predicting behavior than knowing personal idiosyncrasies.

A reanalysis of the original 1962 data by Endler and

Hunt (83), utilizing more appropriate statistical techniques (comparison of variance), however, led to rather different conclusions. It was determined that neither individual differences nor situations contributed substantially, as main sources, more than four to six percent of the total variance. Almost a third of the variance was attributed to the simple interactions. In view of this new evidence, Endler and Hunt changed their standpoint from one of leaning towards situationism to definite interaction within the mechanistic model. They stated (83:334):

. . . the question of whether individual differences or situations are the major source of behavioral variance, like so many issues in the history of science, turns out to be a pseudoissue. In effect there is no single major source of behavioral variance, at least as far as the trait of anxiousness is concerned. Human behavior is complex. In order to describe it, one must take into account not only the main sources of variance . . . but also the various simple interactions . . . and, where feasible, the triple interaction. . . .

The trait of hostility was examined by Endler and Hunt (84) across males and females, and subsequently compared with the trait of anxiousness. The results of this study revealed that persons constitute a source of variance for hostility nearly four times that for anxiousness in the case of men, and nearly three times that for anxiousness in the case of women.

Further evidence in support of the interactionist position was obtained by Endler (81) who examined the proposition by Alker (60) that abnormal and normal people constitute two distinct populations. In this study, again person x situation interaction was identified as an important

source of variance in both populations, and thus, Alker's claim that individual differences was an important source of variance in abnormal subjects was refuted.

In 1974, Endler and Okada (87) established norms for the general trait of anxiousness, using four general situations derived from factor analysis which represented physical danger, interaction with others, ambiguity, and routine tasks. The variance components were similar to that of previous studies.

In support of the contention that cognitive variables have a high consistency, as opposed to social variables which have a low consistency (80), Rushton and Endler (161) revealed that variance due to persons was 49 percent and to the person x situation interaction, 19 percent. Situation accounted for only four percent of the total variance. Individual differences in cognitive (intellectual) functioning across different academic situations, therefore, seem to show remarkable cross-situational generality. This conclusion contrasts markedly where neither the person nor the situation per se is found to be significantly large (16).

Both Endler and Magnusson (37,80,109), in rationalizing this state of affairs suggest that the consistency of the mediating or intervening variables depend on whether such variables are structural, content, or motivational in nature.

Without doubt, the Endler and others' studies have provided the most damaging evidence to both the trait and situational approaches to personality assessment. However,

the mechanistic interactional model is considered a limited approach to behavior research, as will be discussed in the next section.

A review of empirical interactionist literature reveals that several forms of statistical analyses of varying sophistication have been employed. Endler and Magnusson (16) delineated the question empirical investigations have attempted to solve, i.e., "Does the rank order of individuals with respect to a specific variable (e.g., anxiousness or hostility) show the trans-situational stability that is assumed by trait theorists, or is behavior situation-specific." The major approaches have been used to empirically answer this crucial question for trait psychology, and in the process has revealed an interactional viewpoint:

1. By investigating and comparing the variance due to individuals with the variance due to the main sources of situations and reactions (modes of response) and with the variance due to person-situation interactions and other two-way interactions.

2. By studying the correlation of individual rank orders for a specific personality variable across different situations. This approach is a more direct test of the assumption of cross-situational stability. However, it has been less influential than the multidimensional variance components approach. This is probably because the latter provides an empirical basis for developing an alternative to the trait model, i.e., a mechanistic interactional model.



The more direct test of the assumption of cross-situational stability or consistency of behavior, using the correlational approach, was conducted by Harshorne and May (19) in their classic study of honesty. Their results, although highly debated, seemed to conclude the trait theoretical assumption was not justified.

Magnusson and his co-workers (112,113,114), using the same approach as Hartshorne and May (19), investigated the cross-situational stability in ratings of cooperative ability, self-confidence, leadership, and in objective measures of talking time. They did this by a systematic variation of the situational variables of group composition and task. No findings of cross-situational stability were accounted for, and therefore, a trait position could not be accepted. Magnusson (107) interpreted the results as supporting the interactional view of personality, even though a deficiency of a correlation research strategy is that intersituational differences are not possible to isolate.

A further development of the above approach in studying consistency of behavior, is to analyze by factor analysis, a set of intercorrelations between different situational measures of the same main dependent variable (e.g., hostility). According to the trait hypothesis, most of the total variance will be explained by one main factor (67,128).

According to Ekehammar (76:1027), "the interactionist view has not flowered until now, partly because of the inaptness of earlier methodological tools." It is, above all, the

development of the analysis of variance approach directed toward the comparison of variance components that is said to have made possible adequate comparisons between the traitist, the situationist, and the interactionist positions.

#### ANOVA Psychology: Interactionist Position

Endler, Hunt, and Rosenstein (86), in their original investigation of anxiety, utilized the mean squares approach to analyze their data. Ekehammar (76), however, indicates the drawback to this method as being that the mean squares are not directly comparable, since the mean square for each variance source is actually a composite of different variance parameters or components. Ekehammar (76) further indicated that a better approach is to compare the relative contribution of each variance component. In the analysis of variance, each MS computed from a particular sample is a function of the sum of the relevant component sample variances, each component being multiplied by an appropriate coefficient. However, mean squares cannot be added since each may be a composite of variance due to independent variables, their interactions, and error. Nor can they be used to describe the relative contributions of different sources of variance. By breaking down the mean squares into variance components and solving for each component separately, the proportion or percentage of the component sum contributed by each individual component can be determined. Since variances are additive, it is possible to sum the seven components,

and obtain a component sum or total to determine these proportions. This enables a comparison of the relative magnitude of the different components, thus it is possible to determine the relative contributions of persons, situations, and modes of response to the total behavioral variance. In this way, a more direct test of the trait, situation, and interaction positions is available and the issue of cross-situational consistency versus situational specificity may be examined.

The mean squares describe the variance among mean scores (i.e., over individual persons and over modes of response, for example in the case of the mean squares for situations) or among total scores (i.e., over situations and over modes of response in the case of the mean squares for individual differences). It follows that, in order to discuss the relative proportion of variance contributed by each main component, the relative magnitude of variance from each component must be assessed. Various statistical innovators have suggested procedures for partitioning the components of variance (53,72,79,157).

As the logic behind comparing mean squares became doubtful, Endler and Hunt (83) reanalyzed their 1962 data by comparing the relative contributions of the different variance components. This approach is outlined by Gleser, Cronbach, and Rajaratnam (91) and by Endler (79).

This reanalysis changed the answer to the question of whether behavioral variance was primarily a function of individual differences or of situations. It appeared that

behavioral variation was attributable to neither of these factors per se, but to their interactions.

It has been noted that although the technique of estimating components of variance has been known in psychology for some time (e.g., Gleser et al. (91)), Endler and Hunt (82) seem to have been the first who have used it in an attempt to give answers to the person-situation issue.

Bowers (66), furthermore, located 11 studies (61,81, 82,83,84,120,121,122,128,134,136) the majority of which employed the analysis of variance model to partition sources of variance into variance components, in such a way that allowed the variance attributable to the main sources and simple interactions, to be isolated.

#### Limitations of Interactional Research

Ekehammar (76) provided a synopsis of the limitations applicable to the analysis of variance components method, pointed out by personality researchers.

1. Mischel (118) among others considers that the relative magnitude of the main components can be manipulated in a favored direction through a selective sampling of persons and situations, respectively.

2. Overton and Reese (45) among others indicated that only unidirectional, rather than reciprocal, interaction data are treated by the method. Other analytical tools are considered necessary to handle data obtained from different points in time simultaneously.

3. Endler (81), Raush (135) and others stated that the ANOVA method gives no basis for answering the question "How?" which is regarded as the main question for the interactionist. What can be answered is only how much contribute to the total behavioral variation.

4. Endler, Hunt, and Rosenstein (86) observed that different types of behaviors, for example, anxiety reactions sometimes correlated highly, and should therefore be regarded as multivariate dependent variables. However the analysis of variance approach has been delineated to univariate data, that is, only one dependent variable at a time has been treated.

Alker (2) further extends his position regarding the limitations of ANOVA psychology in the study of interactionism. He charges that analysis of variance procedures do not detect reciprocal interactions between situations and persons (or take into account the notion that people to a great extent help characterize the situation.) Alker (2) proposes a two-stage least-squares analysis as a means of estimating the strengths of a relationship, when it is assumed that the two variables reciprocally interact.

Olweus (43:223) attacked the use of analysis of variance components approach used in comparing the interactionist position with competing theoretical views in answering the question, "Do statements about the expected (relative) contributions to total variance represent an adequate characterization of the positions (theoretical) involved?" He

continues:

. . . that many common statements regarding the (relative) size of the variance components to be expected on the basis of a trait and situationist position are obviously incorrect (43:223).

Furthermore, an analysis of what variance contributions may be compatible with the three positions at issue clearly reveals that:

. . . it is impossible to institute adequate tests of these positions by means of ANOVA components techniques . . . several different outcomes are consistent with all three or with two of the positions (43:223).

That is not to say, however, that estimates of relative variance contributions are not worth calculating. It can be of great interest to know how much of the total variance can be predicted on the basis of information regarding persons, situations, and their interactions or how much relative reduction in predictive uncertainty is obtained by specifying the different categories involved (20).

### Criticism of Interactionist Research

While not disputing theoretical and methodological points made by Bowers (76) in his review of the sources-of-variance paradigm, Golding (93) asserts that the inferences made by Bowers (76), and others (38,61,81,83,85,118) from omega-squared ratios are inappropriate. Golding maintains that while omega-squared ratios technically index the theoretically desired property of consistency, he advocates the use of coefficients of generalizability which differ from omega-squared ratios not only in size, but also in inter-

pretative meaning. According to Golding (93), the generalizability coefficient for situations is roughly an index of the extent to which the rank order of situations is consistent across persons. Whereas the omega-squared ratios for persons index the percentage of total variation accounted for by variance due to individual differences, generalizability coefficients for persons index the percentage of observed score variation accounted for by variance due to individual differences.

Golding (93) reanalyzed the data which were available from several interactionist studies that had previously employed omega-square analysis (82,83,120,128). This reanalysis caused Golding (93:283) to conclude that, "as is evident from these data, however, Person x Situation interactions, no matter how they are analyzed are still quite strong . . . ."

Olweus (43), although supporting some of Golding's (93) general conclusions, contends that the use of generalizability coefficients does not represent a solution to the person-situation issue. Olweus claims that it is difficult to make meaningful comparisons between the generalizability coefficients and also that the relative size of such coefficients can hardly be taken as evidence of the relative importance of persons and situations in determining behavior.

Exploring the person x situation x response paradigm, Cartwright (60) maintained that such studies have been unjustifiably biased against discovering appreciable person

variance. He showed that by eliminating variance attributable to response modes, and by restricting the range of situations, one can increase person variance substantially. In a discussion of the S-R Inventory approach, Cartwright (69,152) claimed that there are two modes of response in the S-R Inventory of Anxiety (83,86), both positive and negative modes, and this fact inflates the variance due to the response mode component. As a consequence, both person and situation variance is reduced proportionately. However, the modes of response employed in Endler and Hunt's S-R Inventory of Hostility (84), do not succumb to this criticism, correct as it may be. Cartwright (69,153) further criticized the experiment approach in regard to the range of threat in the situations. He suggests that a scaling of situations be undertaken in order to obtain a set of situations that vary only or mainly in terms of evoking aggressive behavior (132).

### Summary

The current status of general personality research and, therefore, sport personality investigations, is one of confusion and re-evaluation. Husman's (98:59) statement that "our research should be based on some theoretical concept, instead of probing in the dark with inadequate tools, numbers of subjects and poor designs," would appear to be germane to the present status of sport personality. Any honest appraisal of the research to date must conclude that the picture is one of conflicting results and a priori conclusions. New



directions are being called for by many sport personality researchers (17,29,47,56,115,116,146,159,162). This new direction must be taken within the realm of sport, as Rushall (159) has espoused.

Several classes of problems have been identified in sport personality literature (116), and these have added to the confused picture. Problems concerning methodology and interpretation have appeared without justification; these errors are easily eradicated and consequently should not be made. When studies that are free of these errors are considered (102,103,137), a trend of consistency can be located. A third problem, that of conceptual theory, however, is rather more difficult to resolve.

An interactional conceptualization appears throughout the classical formulations of numerous personality theories. In the absence of such elaborate theories, the concept is strongly developed in modern formulations and increasing sophistication of statistical techniques has added even more to its standing. Recent empirical data have further supported the interactionist position. Such empirical research has withstood the limited criticism leveled at it by various researchers (43,69,93).

A differentiation between the mechanistic and dynamic models of interaction has been made. The mechanistic meaning of interaction is closely connected with a mechanistic measurement model for interactional behavior, which has been employed in many of the empirical studies cited (66). These

studies have attempted to resolve the conceptual debate that has surrounded personality research. The conclusions provided by these studies have caused a reassessment of the positions held by many former trait supporters and situationists.

In conclusion, then, the words of Ekehammar (76:1045) seem highly appropriate. He stated that "if interactionism is not the Zeitgeist of today's personality psychology, it will probably be that of tomorrow."

## Chapter 3

### METHODS AND PROCEDURES

The following chapter elaborates on the methods used and the procedures followed in this study. The chapter is subdivided into six specific areas: (1) selection of subjects, (2) testing instruments, (3) methods of data collection, (4) scoring of data, (5) treatment of data, and (6) summary.

#### Selection of Subjects

The subjects involved in this study ( $n=142$ ) were playing members of either ice hockey, lacrosse, or soccer teams in four educational institutions in the Central New York area during the spring of 1977 (Appendix A). These four institutions were chosen because of their proximity, and availability of teams. The subjects were all male varsity or junior varsity athletes with a wide range of playing experience (2-14 years), who ranged in age from 17.8 to 23.8 years.

Members ( $n=30$ ) from three different team sports across three of the four institutions were initially randomly selected to act as raters of the 43 situations and 11 modes of response during the construction of the S-R Inventory. These raters were subsequently eliminated from the possible subject samples. Of the 142 subjects eventually tested, 34 were randomly selected out due to the limitations of the computer

program used for the analyses of the data. From the final subject sample ( $n=108$ ), 43 subjects had been administered the inventory twice. These retested subjects were selected in accordance with availability and opportunity, and in an attempt to encompass all three sports and institutions. Only subject samples from Cornell University were not included in the retesting.

### Testing Instruments

The inventory utilized in this study, the "Inventory of Attitudes Towards Sport Situations," was based on the original S-R Inventories of Hostility designed by Endler and Hunt (84). The inventory consisted of a sample of 15 situations selected from a list of 43 situations intuitively written with the assistance of several coaches and numerous athletes involved in the three sport activities. The criteria for selection of the 15 situations were that (a) the situations were tangible to the athletes either through direct or vicarious experience, (b) the situations ranged from high to low aggression-hostility eliciting, (c) the situations involved different categories of aggressive behavior, (d) when scored, the situations had similar standard deviations, and (e) the situations ranged over the whole spectrum of the game play (Appendix C).

The final selection of situations was undertaken after they had been rated by subjects randomly selected across the three sports. They were rated according to the following

criterion: "How much anger or hostility does this produce in you?" A rating on a five-step scale ranging from "none" to "very much" was employed. The selection of situations took into account the computed mean scores and standard deviations, as well as the criteria stated above.

A sample of 11 modes of response was intuitively selected from the two forms of the original S-R Inventory of Hostility (84). The sample of responses in this inventory included, first of all, certain physiological reactions, because reports of these can most readily be validated by means of physiological recordings. Secondly, various extra-punitive reactions to frustration, and thirdly, various intra-punitive reactions to frustration. Some modes of response were deleted from the available list of 20 as they were of a similar vein. The 11 modes chosen were, furthermore, rated on a five-step scale, ranging from "not at all" to "very well" according to the following criterion: "How well does this behavioral sign reflect your state of anger or hostility when you are angry or hostile?"

The final S-R Inventory of Hostility also employed a Likert (106) scale which requested the subjects to indicate the extent to which they manifested each of the 11 modes of response in the situation in question. A five-step scale was considered appropriate, ranging from "not at all" to "very much." Here, what is "very much" and "not at all" was dependent entirely on the person's individual frame of reference or perception of the labels.

In the design of the inventory, each situation was enclosed in a box at the head of its own page with all 11 modes of response listed below (Appendix D). The instructions were written on the front page (Appendix B), and following the directions of Endler, Hunt, and Rosenstein (86) in their original investigation, the title of the inventory was disguised, reading "Inventory of Attitudes Towards Sport Situations."

### Methods of Data Collection

The coaches of the respective teams at the four participating institutions were contacted through personal interview and the purposes of the current investigation were briefly outlined. In relation to soccer, only those coaches undertaking spring training were contacted in order to make data collection feasible. Permission was obtained from the coaches to proceed with the investigation and team lists were obtained. A meeting was arranged with each of the teams immediately prior to, or after a practice session where data could be collected from all team members simultaneously. This was with the exception of the lacrosse sample from Cortland State, who were tested immediately following an important game. At each meeting, the subjects were provided with an inventory booklet, a set of three computer answer cards, and a pencil (#2). The subjects were asked to fill in their names, date of birth, and years of organized play experience in the spaces provided. The investigator then read the general

instructions to the subjects while they followed. The investigator stressed that if any ambiguity existed in the minds of the subjects as to the exact situation being described, they were to answer according to their own individual perception of the situation. An opportunity for questions was given, followed by an unlimited time period in which to complete the answer cards in the manner prescribed (Appendix 8).

Five to six weeks after the first administration, the inventory was administered a second time to approximately a third of the initial subject group. An even distribution across sports was selected because of availability and time, and were retested. The second administration followed exactly the same procedures as above--time being the only intervening variable. Five or six weeks was considered appropriate to eliminate the possibility of memory retention, and reduce the reflection that boredom and negativism might have (83).

#### Scoring the Data

From the original 142 subjects, a random sample of 108 subjects were chosen because of the limitation of the computer program. The demographic data were then arranged and analysed by calculator. The mean and range of ages of the subjects were calculated as well as the mean and range of organized play experience. These calculations were obtained for both the sport samples and the group as a whole. The data from the markread computer answer cards, used for inventory, were punched to data cards and appropriate stat-

istical analyses were performed on the data in order to provide information to test the hypotheses.

### Treatment of Data

Initially, ratings of 43 situations and 11 modes of response were subjected to computer analysis to obtain mean scores and standard deviations. A rank order of the situations was obtained ranging from high to low hostility eliciting.

The relative contributions of the variance from persons, situations, modes of response, simple interactions, and residual--as well as isolating the variance due to triple interaction and error--were assessed by a factorial design analysis of variance model (BMD 02V). The procedure used to partition variance from the various sources was the mixed effects model reported by Endler (79), Endler and Hunt (83), and by Gleser, Cronbach, and Rajaratnam (91). Within this design, the subjects were random, while the situations and modes of response were considered a finite population (fixed).

Internal consistency for the inventory data was examined using Cronbach's coefficient alpha (73). The reliability of the situations were examined as well as the modes of response in the inventory. Coefficient alpha was utilized to test the coefficient of equivalence of the present inventory. This method randomly samples two items from a pool in a given test and correlates these measures in order to determine internal consistency of the test.

The stability of the total inventory and the situation scores was determined by test-retest coefficients after a five



to six week interval, using Pearson product-moment correlation.

The triple interaction, considered psychologically significant, was determined by administering the inventory a second time after a five to six week interval. The data from both administrations were then subjected to a three way analysis with two observations per cell as described by Endler and Hunt (85), and Silverstein and Fisher (144).

### Summary

The basic design of this study was based on the one formulated by Endler, Hunt, and Rosenstein (86), and utilized by Endler and Hunt (84). The intention was to construct the S-R Inventory of Hostility in Sport Situations and use it to collect data from the athlete population samples.

Members of ice hockey, lacrosse, and soccer teams from four colleges or universities served as subjects ( $n=142$ ) in the study.

A second administration of the inventory was given to a sample of the subject population ( $n=43$ ) five to six weeks after the first administration. This retest was used to extract the triple interaction from the residual component and to determine test stability of the inventory.

Appropriate statistical analyses of the data were performed to obtain pertinent evidence to test the hypotheses. A factorial design analysis of variance model was appropriate, to assess the relative contributions of variance components. The procedure used to partition variance from various sources

was the mixed effects model.

Internal consistency and stability of the inventory was reported and intercorrelations of situations and modes of response were calculated.

## Chapter 4

### ANALYSIS OF DATA

The results of this study are presented in this chapter. The specific areas of this presentation are as follows: (1) analysis of demographic data, (2) mean scores and standard deviations for the 15 sport situations, (3) mean scores and standard deviations for the 11 modes of response, (4) coefficient alpha reliabilities for situations and modes of response, (5) response stability of the S-R Sports Inventory, (6) intercorrelations among situations, (7) intercorrelations among modes of response, (8) the results of an analysis of the sources of response variance, and (9) summary.

#### Analysis of Demographic Data

The demographic data were organized for analysis of the mean age and years playing experience of the subjects across the three sports--ice hockey, lacrosse, and soccer. From the 108 athletes (randomly selected from the original total of 142) participating in this study, a balance of 36 subjects per sport were selected from the total sample. Overall, their mean age was 20.4 years (ranging from 17.8 to 23.8), and their playing experience ranged from two to 14 years of either ice hockey, lacrosse or soccer at the

club, junior varsity or varsity college or high school level.

Furthermore, analysis of the three sports taken independently revealed that their playing experience ranged from five to 14 years for ice hockey, two to nine years for lacrosse, and four to 14 years for soccer, with the mean playing experience 8.5, 6.4 and 7.8 respectively.

Mean Scores and Standard Deviations  
for the 15 Situations

The means and standard deviations for the 15 sport situations are tabulated in Table 1. The mean scores of the situations ranged from a high of 2.90 for the situation in which a player's game is being cramped by an opponent, to a low of 1.80 for a situation where a player is brought crashing to the ground, fair and square. The standard deviations for the situations ranged from a high of 1.47, again for the situation where the player's game is being cramped, to a low of 1.09 for the situation in which a player is brought crashing to the ground, fair and square.

Mean Scores and Standard Deviations for  
the 11 Modes of Response

The mean scores and standard deviations for the 11 modes of response are tabulated in Table 2. The means ranged from a high of 3.51 for "frown," to a low of 1.52 for "want to yell." The standard deviations for the modes of response ranged from a high of 1.47 for "lose patience," to a low of .90 for "want to yell."

Table 1

Means, Standard Deviations, and Coefficient Alpha  
Reliabilities for Total Inventory, and for  
Each of the 15 Sport Situations

Item	$\bar{X}$	SD	a
Total Inventory	2.54	1.40	.89
Situation:*			
1. Defensive mistake/hit hard	2.73	1.41	.92
2. Coach's order/go hit	2.67	1.35	.91
3. Team-mate hit from behind	2.70	1.42	.94
4. Get "psyched"/aggressive	2.15	1.29	.93
5. Official makes unfair call	2.82	1.38	.92
6. Ahead and attacking	2.67	1.43	.88
7. Retaliate/penalized	2.32	1.36	.88
8. Play being cramped	2.90	1.47	.91
9. Tackled hard but fair	1.80	1.09	.90
10. Fake opponent/pulled down	2.54	1.37	.90
11. Kept waiting by opponents	2.54	1.35	.82
12. Report to J.V.	2.68	1.39	.76
13. Spectators making fun	2.69	1.34	.86
14. Position challenged/freshman	2.77	1.43	.86
15. No officials nearby/retaliation	2.18	1.29	.88

\*For full phrases see Appendix C.

Table 2

Mean Scores, Standard Deviations, and Coefficient  
Alpha Reliabilities for Each of  
the 11 Modes of Response

Item	$\bar{X}$	SD	a
Modes of Response:*			
1. Want to hit	2.10	1.23	.88
2. Lose patience	3.30	1.47	.87
3. Swear	2.29	1.35	.89
4. Grind teeth	2.26	1.26	.92
5. Heart beats faster	2.52	1.32	.90
6. Want to yell	1.52	0.90	.88
7. Frown	3.51	1.38	.89
8. Feel irritated	2.60	1.34	.88
9. Hands tremble	2.47	1.34	.88
10. Become enraged	2.92	1.41	.87
11. Become tense	2.49	1.28	.91

\*For full phrases see Appendix D.

Coefficient Alpha Reliabilities for the Total  
Inventory, Situations, and for Modes of  
Response

The coefficient alpha reliabilities for the total inventory and for the situational scales are reported in Table 1. Coefficient alpha is used to test the coefficient of equivalence and determine the internal test consistency. The alpha reliabilities for the situational scales ranged from a high of .94 for the situation in which a team member is brought crashing to the surface from behind, to a low of .76 for the situation in which the player's letterman position is being challenged by a freshman. The range of reliabilities for the situations was .18.

The coefficient alpha reliabilities for the modes of response scales are tabulated in Table 2. The alpha reliabilities in general compare with those for the situations, but have a smaller range than those for situations. The alpha reliabilities for modes of response ranged from a high of .92 for "grind teeth," to a low of .84 for "feel irritated." The range of alpha reliabilities for modes of response was .08.

Response Stability for the S-R  
Sports Inventory

The mean scores, standard deviations, and test-retest coefficients for the 43 selected subjects after a five to six week interval are tabulated in Table 3. The means for the test ranged from a high of 3.57 and 3.20 for the retest

Table 3

Response Stability\* of the S-R  
Sports Inventory

Item	Test		Retest		r
	$\bar{X}$	SD	$\bar{X}$	SD	
Total Inventory	2.59	1.06	2.55	1.01	.51
Situation:*					
1. Defensive mistake/hit hard	2.21	0.97	2.32	0.66	.29
2. Coach's order/go hit	3.39	1.14	2.29	0.81	.31
3. Team-mate hit from behind	2.41	1.22	2.77	0.97	.59
4. Get "psyched"/aggressive	2.30	0.98	2.42	0.82	.39
5. Official makes unfair call	2.55	1.06	2.88	0.98	.56
6. Ahead and attacking	1.51	0.63	1.71	0.77	.56
7. Retaliate/penalized	3.57	0.89	3.20	0.94	.75
8. Play being cramped	2.75	0.98	2.64	1.00	.70
9. Tackled hard but fair	2.46	0.98	2.51	0.98	.70
10. Fake opponent/ pulled down	2.88	0.99	2.88	1.06	.69
11. Kept waiting by opponents	2.43	0.69	2.28	0.94	.34
12. Report to J.V.	2.22	0.65	3.10	1.10	.29
13. Spectators making fun	2.90	0.93	2.46	1.06	.66
14. Position challenged/freshman	2.30	0.79	2.30	0.99	.27
15. No officials nearby/retaliation	2.93	1.03	2.54	0.99	.41

\*S-R Inventory re-administered to selected subjects (N=43) 5-6 weeks after initial test administration.



of the situation in which a player is penalized for retaliating after being punched, to a low of 1.51 and 1.71 for the test and retest means respectively, for the situation in which the team is ahead of a weaker team but constantly attacks. The standard deviations ranged from a high of 1.22 for the test, in the situation where while sitting on the bench a team member is brought crashing to the surface from behind, and 1.10 for the retest of the situation where a player is bluntly told to attend J.V. practice from now on, to a low of .63 for the test, in a situation where the team leads by a few goals but constantly attacks a much weaker opponent, and .66 for the retest of the situation in which a player is hit hard upon receiving a bad pass from a team-mate.

The means, standard deviations, and test-retest coefficient for the total inventory are reported in Table 3. The test retest reliability was reported to be .51.

#### Intercorrelations Among Situations

The intercorrelations among situations are tabulated in Table 4. These scores ranged from a high of .71 for situation two and situation three, to a low of .05 for situation five and situation 15. Generally, the intercorrelations among situations were fairly low.

#### Intercorrelations Among Modes of Response

The intercorrelations among modes of response are

Table 4

Intercorrelations of the 15  
Sports Situations\*

Situation	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2	51													
3	49	71												
4	46	44	47											
5	47	44	51	47										
6	51	61	67	45	50									
7	29	51	50	47	40	51								
8	40	64	67	39	45	60	40							
9	39	40	42	48	44	43	46	33						
10	54	57	60	50	51	63	40	64	49					
11	42	49	49	40	52	46	43	49	56	52				
12	16	13	09	07	08	14	11	12	08	15	04			
13	12	23	19	09	08	19	21	22	12	21	06	56		
14	12	21	19	10	06	16	17	25	11	21	05	52	68	
15	10	11	07	04	10	05	12	11	10	12	05	50	46	47

Note: Decimals omitted

\*Ice Hockey, Lacrosse, Soccer

tabulated in Table 5. These scores range from a high of .51 for mode of response seven and 10, and mode of response nine and 10, to a low of .20 for modes of response six and seven, six and 10, and six and 11. Generally, the intercorrelations among modes of response were low.

### The Results of An Analysis of the Sources of Response Variance

The degrees of freedom, sums of squares, and mean squares from a factorial design analysis of variance of the sampled subjects are reported, along with the variance components and percentage of variance attributable to the main sources, simple interactions, and residual, which were partitioned out using the model outlined by Endler (79), and by Gleser, Cronbach, and Rajaratnam (91). These results are tabulated in Table 6.

The variance attributable to the three main effects of persons, situations, and modes of response, were 20.17 percent, 12.22 percent, and 5.07 percent, respectively.

The percentages of variance attributed to the three simple interactions of persons x situations, persons x modes of response, and situations x modes of response were computed to be 15.35, 8.35, and 3.19. After considering these results, the first null hypothesis, that neither the persons nor the situations will contribute appreciably greater variance to the total behavioral variance than the variances attributable to the three simple interactions, was accepted.

The variance attributable to the residual component

Table 5

Intercorrelations of the 11  
Modes of Response

Mode of Response	1	2	3	4	5	6	7	8	9	10
2	34									
3	46	41								
4	41	34	43							
5	38	35	40	41						
6	22	17	30	23	29					
7	35	51	39	36	45	20				
8	45	47	49	47	46	30	48			
9	41	35	45	46	47	27	44	48		
10	42	41	41	34	42	23	51	44	51	
11	33	30	26	29	31	20	41	35	44	44

Note: Decimals omitted.

Table 6

Variance Analysis for Main Sources, Simple Interactions,  
and Residual Derived from S-R Inventory  
of Hostility in Sports Situations

Source	df	MS	$\sigma^2$ Component	%
Persons (P)	107	68.044	.408	20.17
Situations (S)	14	298.000	.250	12.22
Modes of Response (M-R)	10	169.700	.103	5.07
P x S	1498	4.132	.311	15.35
P x M-R	1070	3.341	.175	8.35
S x M-R	140	7.684	.065	3.19
Residual	14980	0.715	.715	35.35
Total	17819	551.616	2.026	100.00

was 35.35 percent of the total behavioral variation, as reported in Table 6. This percentage led to the acceptance of null hypothesis two, that the variance attributable to the residual component, as opposed to that attributable to either the main effects or their interactions taken independently, will be an appreciably large part of the total behavioral variance. The residual variance of 35.35 percent was 15.18 percent greater than the second largest single source of variance, that of 20.17 percent attributable to the person.

In a replication of this analysis of the response variance using 43 selected subjects, the residual variance was further partitioned into triple interaction (persons x situations x modes of response) and error variance. In order to partition out this source of variance, which is considered to be, in reality, psychologically significant, two observations per cell are necessary. Using a mixed model (Ss random, situations and modes of response fixed), the variance components were estimated in accordance with Endler and Hunt (84) and Silverstein and Fisher's (144) analysis. This partitioning of the residual component was done by administering the inventory a second time to 43 selected subjects, in the hope of achieving at least an approximate solution. The variance attributable to the triple interaction was computed to be merely 1.20 percent, with the error or within variance component being 26.20 percent. These results are tabulated in Table 7. Although the variance percentages were not identical with the full sample analysis, the triple

Table 7

Variance Analysis for Main Sources, Simple Inter-  
actions, Triple Interaction, and Error  
Derived from Retest of 43 Subjects

Source	df	MS	$\sigma^2$ Component	%
Persons (P)	42	156.761	.94512	30.36
Situations (S)	14	181.485	.35230	11.32
Modes of Response (M-R)	10	72.140	.10560	3.39
P x S	588	7.094	.57073	18.33
P x M-R	420	4.028	.21412	6.88
S x M-R	140	3.927	.07236	2.32
P x S x M-R	5880	0.891	.03740	1.20
Error	7094	0.816	.81585	26.20
Total	14188	427.142	3.11348	100.00

interaction and error component were identified. This enabled the investigator to separate these two components within the residual for an approximate solution of the total interaction of the main effects.

### Summary

As a result of analysis, the first null hypothesis, that neither of the main effects will contribute appreciably greater variance to the total behavioral variance than the variances attributable to the three simple interaction--persons x situations, persons x modes of response, and situations x modes of response, was accepted. The second null hypothesis, that the variance attributable to the residual component, as opposed to that attributable to either the main effects or their interactions taken independently, will be an appreciably large part of the total behavioral variance, was again accepted.

By administering the S-R Inventory of Hostility in Sport Situations twice to the selected subjects, the relative contributions of the persons, situations, and modes of response, and all their interactions to the total hostility variance were determined. The variance due to triple interaction, which had not previously been estimated, was found to account for only 1.20 percent of the <sup>+</sup>total behavioral variance.



## Chapter 5

### DISCUSSION OF RESULTS

The main aim of this chapter is to discuss the results tabulated in Chapter 4. The specific areas for discussion are as follows: (1) a discussion of the total S-R Inventory scores for situational scales, and modes of response scales, (2) a discussion of the variance components and percentages of variance attributed to the main effects, simple interactions, and the residual component, (3) a discussion of the triple interaction and error components, and (4) summary.

#### Total S-R Inventory Scores, Situational Scales, and Modes of Response Scales

This section is further subdivided into the following subsections: (a) a discussion of the mean scores and standard deviations for the total inventory, situational scales, and modes of response scales, (b) a discussion of the inter-correlations among situations and modes of response, and (c) a discussion of the reliabilities of the total inventory, situational scales, and modes of response scales.

#### Mean Scores and Standard Deviations for the Total Inventory, Situational Scales, and Modes of Response Scales

The mean scores and standard deviations for the total inventory and for the situational scales are tabulated for

presentation in Table 1 (p. 73). The mean score for the total inventory is 2.54 with a standard deviation of 1.40. These scores are based on a single-unit five-point Likert (106) scale, therefore, the mean score for the total inventory was considered to be as anticipated. This mean score was anticipated because of the construction of the inventory itself. The situational scale was designed by selectively choosing 15 sport situations from a total of 43 possible situations relating to the three contact sports. These 43 situations were initially rated by 30 randomly assigned athletes from the possible subject samples. The rating criterion was: "How hostility or anger producing is this situation likely to be for you?" The final 15 situations selected ranged from high to low hostility evoking according to the raters' responses. The mean rank for the final 15 selected sport situations, compared to the rankings of the 43 possibles, was 21.0, which is approximately the median point. Thus, an effort was made to counteract the criticism made by several researchers (43,69), concerning the possible predetermination of results to support a particular point of view. The construction of the final inventory included a realistic range of situations, which was not weighted either high or low aggression-hostility evoking. Thus, the total inventory mean score (2.54) is a good indicator that the S-R Inventory of Sport Situations included a realistic range of situations and attempted to counteract all design criticisms with regard to obtaining a particular set of results.

The mean scores for the situational scales ranged from a high of 2.90 for the situation in which the player is being cramped by an opponent, assigned specifically to keep him out of the play, to a low of 1.80 for the situation in which the player is brought crashing to the ground, fair and square. The mean score of a particular situation generally indicates the intensity to which the situation evoked hostility or aggression in a particular subject. Thus, the range in mean scores would indicate that different situations tend to elicit different intensities of responses across individuals. Insofar as a trait of hostility or aggression exists it must consist of a tendency to manifest these indicator responses consistently across the variety of sport situations. The stronger the responses and the more consistently the various situations evoke them, the stronger would be the trait of hostility-aggression and the more hostile or aggressive would be the individual manifesting these behavioral indicators.

It is interesting to note that the final inventory mean scores for the situations are generally lower than those obtained from initial ratings of the 15 chosen situations. From the four situations (4,6,9,13) rated low hostility-aggression evoking, only two scored low in the final analysis. From the five situations (3,5,7,10,12) rated high hostility-aggression evoking only three could be considered as eliciting high mean scores. A possible cause of this difference in scores may simply be that different individuals perceive a situation differently, i.e., as eliciting differing intensities

of response, and therefore, the mean response to the situations are dissimilar. Or, that with the situational scores being from a larger  $n$  than the initial rating scores (108 to 30 subjects) the final sample group scores may have tended to regress towards the mean score.

The standard deviation for the total inventory is 1.40 and is reported in Table 1 (p. 73). Subjects varied widely in their reported responses to all the situations. Considering that subjects utilized from three different contact sports and situations within those sports differ, this wide response variance could be expected. The subjects might have had a problem relating to all the situations, because of the fact that the situations encompassed three sport activities, although, great care was taken to select situations plausible to all three sports.

The standard deviations for the situations ranged from a high of 1.47 in which a player's game is being cramped by an opponent, to a low of 1.09 in the situation where a player is brought crashing to the ground, fair and square. It is of interest to note that these situations also had the highest and lowest mean scores, respectively.

The mean scores and standard deviations for the modes of response scales are tabulated in Table 2 (p. 74). These mean scores ranged from a high of 3.51 for "frown," to a low of 1.52 for "want to yell." The wide range of scores is probably due to the fact that the situational scales ranged from high to low hostility-aggression evoking. This influenced the level of responses to those situations.

Furthermore, the standard deviation for the modes of response scales are generally high, indicating a wide variance in reported intensities of response. It seems clear that certain response indicators were more representative of aggressive-hostile behavior. Because of the discrepancies in response indicators acceptable across the three sport activities tested, the wide variance in the response indicators might be expected.

#### Intercorrelations Among Situations and Modes of Response

Scores for the intercorrelations among the situational scales are tabulated in Table 4 (p. 78). These scores range from a high of .71 for situation two and three, to a low of .04 for situations 11 and 12. Generally, the intercorrelations among situations were fairly low. This points to the fact that the situations utilized in the inventory are generally different from each other. Low correlations were anticipated; the situations were selected in order to represent three different categories of aggression-hostility indicated in the literature. The situations were attempting to produce self-report measures of either reactive, instrumental, or conformist aggression-hostility. Reactive and instrumental athletic aggression categories were represented in six situations each, while conformist athletic aggression was represented in three situations. However, the diversified scores for the intercorrelations among the situational scales makes it difficult to establish whether or not, the three categories of aggression-hostility were

differentiating. Notwithstanding, the correlations were seemingly low enough to posit some possible differentiation.

The intercorrelations among the modes of response are tabulated in Table 5 (p. 80). These scores ranged from a high of .51 for modes two and seven, seven and 10, and nine and 10, to a low of .17 for mode two and six. Generally, the intercorrelations among modes of response were unexpectedly high. This indicates that the modes of response used in the inventory tended to apply to similar behaviors, i.e., response modes that may be nondifferentiating or possibly not good response indicators for certain behavioral characteristics in sport situations. A factor analysis of both the modes of response scales and the situational scales may have provided more representative scales, i.e., differentiating response indicators.

#### Reliabilities of the Total Inventory, Situational Scales, and Modes of Response Scales

The coefficient alpha reliabilities for the total inventory and for the situational scales are tabulated in Table 1 (p. 73). Cronbach's coefficient alpha is a test of the coefficient of equivalence and is used to determine internal test consistency--an estimate of the central tendency among correlations obtained from all possible splittings. The alpha reliability for the total inventory was .89 which is similar to the coefficient alpha reported by Endler and Hunt (82,84,86) for their S-R Inventories of Hostility (and Anxiety) dealing with general situations.

The alpha reliability for the inventory in this study also compares favorably with Czarnecki's (153) and Horsfall's (157) results, dealing with sport-related inventories. This reliability score indicates the degree to which a subject holds rank in a group as a function of various splits among situations and modes of response scales in the S-R Inventory. The problem of reliability lies in the degree to which patterns of responses are reproducible across situations and across classes of situations (97).

The alpha reliabilities for the situational scales scores indicate the degree to which a subject holds rank in a group as a function of the various splits among the modes of response. The alpha reliabilities ranged from a high of .94 for the situation where, while sitting on the bench, a player's team-mate is hit hard from behind, to a low of .76 for the situation in which a varsity player is bluntly told to attend J.V. practices from now on. The coefficient alphas for the situational scales are generally higher than those obtained in other sport-related studies (153,157). They are particularly higher than the reliabilities obtained in the Horsfall (157) study related to anxiousness in basketball situations, which were generally in the .60s.

The coefficient alphas for the modes of response scales are tabulated in Table 2 (p. 74). Their coefficients have a smaller range than those for situations, but are still comparably high. The reliability for the modes of response indicates the degree to which a subject holds his rank in the group across situations. These reliability coefficients

generally compare to those reported in the Endler and Hunt (84) study of general situations, were in the .80s and .90s, and those reported in Czarnecki's (153) study of sport situations.

A retest of the S-R Inventory of Hostility in Sport Situations was administered to 43 selected subjects from the original 108 subjects after a five-to six-week interval. The mean scores, standard deviations, and test-retest coefficients are tabulated in Table 3 (p. 76). The stability of the inventory is determined by the test-retest coefficient, which was computed to be .51. This coefficient indicates the degree to which subjects' responses to the presented situations stay consistent over time, and might be considered relatively low compared to similar findings (153). The range of coefficients for the situations across the two administrations were from a high of .70, to a low of .29. In fact, six situations (1,2,4,11,14,15) have correlation coefficients less than .50, and only one situation (7) had a coefficient above .70.

A number of possible factors may be considered accountable for such low stability coefficients. It may be of interest to compare mean scores and standard deviations of the full sample (Table 1, p. 73) to those of the selected sample of 43 subjects who were retested (Table 3, p. 76). Generally, there seems to be a dissimilarity between the full sample's responses and the selected sample responses. For example, the total sample mean score and standard deviation for situation six were 2.67 and 1.43, respectively, whereas the selected 43 subjects' responses in the first



administration were 1.51 and .63, respectively. Such inconsistencies between the two sets of scores is, therefore, a possible factor in producing the low inventory coefficient of stability. A more representative sample may have provided more reliable data, i.e., consistent responses vis-à-vis the total population sample, and within subjects across time.

Although no trends within categories of aggressive-hostile behavioral responses were obtained, it appears that those situations rated medium hostility evoking produced the low stability coefficients. Five (1,2,11,13,14) of the six situations initially rated in the medium range of hostility-aggression evoking, had coefficients less than .50. However, in response to the situations during the actual testing, subjects did not necessarily perceive these situations as only medium hostility-aggression evoking. Another possible, more plausible reason for the lack of response stability, however, may be that negativism or boredom was involved. This problem was emphasized by Endler and Hunt (79). This investigator may have been unsuccessful in relating to his subjects the importance of responding as truthfully as possible.

Variance Components and Percentages of Variance  
 Attributable to the Main Effects, Simple  
 Interactions, and the Residual

This section of the discussion is further subdivided into the following sections: (a) variance attributable to persons, (b) variance attributable to situations, (c) variance attributable to modes of response, (d) variance attributable to the simple interactions, and (e) variance attributable to

the residual component.

### Variance Attributable to Persons

The discourse throughout this study has stressed the refutation of the viability of independently considering the person in the understanding or prediction of behavior (66,80,81,83,84,86,87,118,121,122). Such a refutation has been supported by evidence gained from a logical analysis of the sources of variation in behavior. Results of these empirical studies, clearly indicate that the relative consistency hypothesis, with respect to stable rank orders of behavior across situations, is not generally valid.

In considering the results of this study in regard to this discourse, it is important to anticipate what the trait theorists would expect to see from such an analysis. Personologists have assumed that personality variables are the major source of behavioral variance and are expressed in a relatively consistent manner across different situations. Alker (60:1), despite the absence of supporting empirical evidence, claims "that personality variables can explain people's behavior even though that behavior varies from situation to situation."

Empirical evidence presented by Endler and Okada (87) tends to substantiate Alker's contention that behavior can be consistent in the sense of being coherent; that is, lawful and inherently predictable, without being stable in either absolute or relative terms. Endler and Okada conclude from their findings that individuals can differ with regard

to mean level of state anxiety reactions across situations, indicating a stable difference in anxiety reaction dispositions (trait). And, that individuals with the same mean levels of state anxiety across situations differ in a systematic predictable way in their patterns of state anxiety reactions. Behavior was seen as consistent in the sense of coherence; individuals behave in a way that can be predicted for each situation.

Within the sport's realm, situations an athlete encounters are not a random selection of all possible situations. Many situations are chosen or selected, and others are imposed on the athlete (required situations). An athlete may choose to join a particular team, wherein he is then required to attend daily practice. By choosing to participate, an athlete restricts the kinds of situations he encounters. These situations ultimately become a function of and have relevance for the athlete concerned. Mischel (118) has discussed this fact as one explanation for the general impression that individuals' behaviors are stable across situations.

It seems clear that the idiographic way in which an individual's behavior is affected by situations may be assessed and confirmed by the variance component results of the empirical studies investigating mechanistic interaction (82,83,84,86,87,153,157). The idiographic patterns of behavior do not deny the existence of coherence.

The variance attributable to the persons obtained

in this study, and others (84), account for almost twice as much variation as that for anxiousness (82,83,85,86,153,157). Over 20 percent of the total behavioral variance for hostility-aggression was attributable to individual differences. It could plausibly be assumed that hostility-aggression is a more ingrained (if not innate) disposition than is anxiety, and moreover, it may exist within the individual as a permanent and inseparable attribute, predictable across time. The person variance obtained in the present study may represent a more fundamental meaning of consistency--coherence--which is regarded as one of the basic derivations of the interactionistic model of behavior (109).

Validity and reliability coefficients for measures of personality traits usually range from .20 to .50 and are typically about .30. A correlation of .30 accounts for about 10 percent of the relevant variance, a trivial amount (82,97,117). It is true that validity coefficients are attenuated by reliability coefficients and by errors of measurement, and that self-report measures create additional statistical and methodological problems. However, it is equally evident that behaviors presumed to be indicators of stable personality traits are quite specific, and are dependent on both the evocative situations and modes of response used to assess behavior. As can be seen from Table 6 (p. 81), the results of this study support the contention that person variance is inconsequential if behavioral prediction is to be made solely on the strength of this variable. The

contribution from persons (20.17 percent) is found to be a relatively small portion of the total behavioral variation.

Kane (24,158) has indicated that during the present stage of sport personality assessment, a figure of 20 percent predictive ability from persons would be acceptable. Fisher (17) has argued that this amount is simply inadequate. However, this point becomes less important as the results of this study indicates that the behavioral variance attributable to situations and simple interactions are just as important, if prediction of behavior is to be attempted.

The relatively limited amount of variance attributable to persons in the present study, in relation to the other main effects and their interactions, merely echoes the findings of other empirical studies which have employed similar techniques (108,121,122,128,136). This is especially true when the results are compared with those of Endler and Hunt (84). Such a comparison is made in Table 8. As can be seen, the variance attributable to persons in the Endler and Hunt sample (19.08) and that of the present sample (20.17) are highly compatible. However, both percentages are of fairly limited consequence per se.

Critics of the S-R Inventory approach (43,69) have indicated that it could be possible to artificially substantiate one's point of view by simply employing subject extremes and the type of situation in which those extremes might be most apparent. It is argued that the relatively limited portions of behavioral variance attributable to persons may be a function of the homogeneity of subjects.

Table 8

Comparative Results of Sport and Non-Sport Hostility  
Studies Utilizing the S-R Inventory Approach

Endler and Hunt (83) Results	Sources of Variation	Present Results
19.08%	Persons (P)	20.17%
4.64%	Situations (S)	12.22%
13.90%	Modes of Response (M-R)	5.07%
10.40%	P x S	15.35%
12.62%	P x M-R	8.65%
3.01%	S x M-R	3.19%
32.15%	Residual	35.35%
100.00%	Total	100.00%

One may expect that by employing a homogeneous group of subjects and situations, the variance attributable to persons would be somewhat limited. Conversely, by employing subjects that are extremes, and the types of situations in which those extremes may be readily apparent, this would inflate the person variance. However, the present study involves a fairly homogeneous group of subjects (intercollegiate athletes) and sport situations. If it is assumed that the subjects and situations represent the area in question, it must also be assumed that the variance attributable to persons is representative. The Endler and Hunt (84) results from general situations, reported in Table 8, are comparable to those of the present study, even though the subject population was not as homogeneous a group.

The results of this study, and those of Endler and Hunt (84) indicate that individual differences in the intensity of a trait of hostility-aggression, are genuinely more prominent than individual differences in the intensity of a trait of anxiousness. In fact, persons constitute a source of the total variance for hostility-aggression nearly four times what it is for anxiousness, thus, the two traits appear to operate differently. Furthermore, when comparing Czarnecki's (153) and Horsfall's (157) results to the present study, (data all obtained from homogeneous samples responding to sport situations), it was found that persons constituted a source of the total variance for hostility-aggression over two times that for anxiousness. An explanation of this

greater contribution of persons to the total variance for hostility-aggression than for anxiousness is not readily apparent. One tentative explanation may be that the response indicators of hostility-aggression show less variation than those for anxiousness, and that this lesser variation leaves room only for a lower level of interaction with situations for hostility-aggression than anxiousness. This might be even more apparent when considering the present study. Athletes might relate more readily to the modes of response than the general population, and feel less prohibited in expressing reported responses of anger or hostility in situations which have been readily experienced. The variance attributable to the modes of response is in fact much smaller in sport specific studies than for general situation studies.

#### Variance Attributable to Situations

The behavioral variation attributable to the situation component was slightly over half of that attributable to the person component (12.22 percent). This would indicate that the sport situation a person is placed into contributes almost half as much to the total behavioral variation as the person himself. It also indicates that neither persons nor situations are more important in determining behavior in a sports setting. However, an important proportion of variance (32.39 percent), almost a third of the behavior variation, is accounted for by knowing both the situation and the person.

In the Endler and Hunt (84) study reported in Table 8



the contribution of situation variance (4.64 percent) was approximately a third of that obtained in the present study. It is conceivable that situations may be more important determinants of behavior under the circumstances when certain demands for conformity are apparent, as in the case of contact sports, than is the case for general situations especially in regards to the expression of hostility or aggression which may be regarded as antisocial.

The amount of variance attributable to the situation has widely varied in studies which have attempted to isolate variance component percentages. Raush, Dittman, and Taylor (134), in a study of the behavior of six hyper-aggressive boys across six settings, recorded a nominal 2.2 percent of variance due to settings. However, studying anxiety, Moos (121) reported a 17.6 percent variance due to situations. Bowers (66) indicated that, of the 11 studies he reviewed, the average variance attributable to situations was 10.17 percent, a figure which is only slightly lower than in the present study. Sports studies (153,157) that have isolated the variance component percentages for anxiety have reported similar results for the proportion of variance due to situations.

A possible explanation for the discrepancy between the variance attributable to the situations for the general population, as opposed to that for the sport population, is that the situations were representative of the area in question, i.e., sport. A more heterogeneous sampling of

situations was included in the present study which may have increased the proportion of variance. The situations selected for the general population may have lacked diversity. Certainly, it is obvious that the sport situations were far more representative for the athletes than were the situations for the general population reported by Endler and Hunt (84). However, when the individual is free to respond according to his own inclinations, as in the case of this study, the situation per se makes no more contribution, if not less, to the total behavioral variation than does the individual.

#### Variance Attributable to Modes of Response

As can be seen in Table 6 (p. 81), 5.07 percent of the total behavioral variation was attributable to the modes of response. As compared to the two other main effects this percentage is not considerable, but it still warrants some consideration. A clear implication of the contribution to the total behavioral variance made by response indicators is that it is important for different raters of hostility and aggression to consider the same indicator responses. Any discrepancy in such could obviously lead to a disagreement in results. For example, consider two hypothetical studies. If in the first study the investigator nominates the subject's perception of his heart rate as an indicator of aggression or hostility, and in the second the subject's hands trembling is considered, there is no reason to believe that there need to be any similarity in the results between the two studies.

Although there was a strong similarity in the variance attributable to the persons, and to the simple interactions in the present study and the Endler and Hunt (84) study, the modes of response variance is appreciably different. Only five percent of the behavioral variance was attributable to modes of response in sport situations, whereas the figure reached almost 14 percent in general situations. There are several possible explanations for this appreciable difference. It is plausible that the response indicators overall were more applicable to sport situations than to general situations. Although athletes do not digress from the general population in terms of personality, it is not too difficult to conceive of their homogeneity in relation to their perception of both the physiological and psychological modes of response. Moreover, athletes may be less inhibited in their behavioral responses than the general subjects. In fact the Endler and Hunt (84) results may well be exaggerated. Some of the modes of response, which are common in both studies, may be considered to be socially unacceptable off the field of play. In general situations, this factor may have exaggerated the variance of reports of behavior more than actual behavior. In contact sport situations, however, it is clear that a different set of norms operate. Thus, the latter variance may not be exaggerated.

#### Variance Attributable to Simple Interactions

The findings that 27 percent of the total behavioral

variation was accounted for by the combined simple interactions is of utmost importance. The overall implications of this are that neither the person nor the situation per se should be considered if an understanding or prediction of behavior is to be considered.

The magnitude of the interaction of persons x situations is higher than that of the findings of Endler and Hunt (84), and, in fact, is the largest of the interactions. This interaction indicates that while behavior is shaped by the situation, the shape it takes is not dependent of the individual characteristics of the person. The person responds more or less to various situations, independently of the mode of response called for. A further assertion which can be made, and a plausible reason for the discrepancy between the two sets of results, i.e., Endler and Hunt's (84) and this study, is that individuals respond more or less to given situations independently of the modes of response called for; the psychological meaning of situations for the individual is the important determining factor. The difference in the modes of response scores in the sport-related situations may be indicative of this simple interaction score difference.

The variance accounted for by the two main sources of persons and situations, plus their interactions, totals almost 60 percent. This figure is almost three times larger than the one which would be given if only one of the main sources was known. This contrast lends positive support to the proponents of the interactionist position (66,76,80,81

82,83,85,86,121,122) who advocate the mutual involvement of both the individual and the situation in the determination of behavior.

The interaction of persons x modes of response (8.65 percent) implies that individuals vary in the patterns of aggressive-hostile response they exhibit in sport situations. It is logical to assume that different individuals respond differently to the same situation. Response tends to vary from person to person. The variance accounted for by the persons and modes of response interaction differs slightly to the findings reported in Table 8 for the general situations and for the sport-related situations.

The interaction of situation with modes of response (3.19 percent) is the smallest of the simple interactions, and, in fact, is a negligible source of variance relative to other sources. However, there is still a tendency for some situations to evoke certain patterns of response across individuals. The findings of the present study are almost identical to the Endler and Hunt (84) study.

#### Variance Attributable to the Residual Component

The largest single source of behavioral variation is the residual component (35.35 percent) which contributed approximately a third of the total variation in both this study, and the Endler and Hunt (84) study. In the initial analysis used in the present study, the model assumes that the residual component is composed totally of error, and the

triple interaction to be zero. However, there is also within the residual, a psychologically meaningful triple interaction component. Unfortunately, when only one score is obtained for the responses of each subject in each situation, it is not possible to partition the triple interaction from the error component.

### Triple Interaction and Error Components

Within the residual component is located the error and triple interaction (persons x situations x modes of response) components. The triple interaction can be interpreted as, in a given situation, a particular individual has a particular mode of response. For example, a given athlete may not yell very often, nor need he be generally hostile or aggressive in a soccer game, but when he is blatantly pulled down from behind after beating his opponent, he may find himself yelling vociferously. Such a triple interaction may be psychologically meaningful and real, and may be radically different from the main effects, simple interactions, and from error.

In order to determine, however, if the triple interaction is statistically meaningful, two observations must be taken on each subject, i.e., by administering the S-R Inventory at least twice to the same subjects. Endler (79) regards this as an unsatisfactory solution, since the scores on the later administration may be more a reflection of negativism, boredom, etcetera, than of hostility

or aggression. But, the present analyses were undertaken in the belief that an approximate solution is better than none at all. Endler and Hunt (82,83) were initially content to guess that the triple interaction might contribute about 10 percent of the total behavioral variance. In an attempt to derive an approximate percentage of the variance due to triple interaction, Silverstein and Fisher (144) administered the original form S-R Inventory of Anxiousness (86) twice to 100 male prisoners within a space of one month, and arrived at the figure of five percent for the triple interaction. Endler and Hunt (82) have also administered several forms of the S-R Inventory of Anxiousness twice to nine samples of subjects and submitted the data to a three-way analysis of variance, assuming a mixed model (subjects random, situations and modes of response fixed). Depending upon the sample and form of the inventory, the percentage of the total variance from triple interaction has ranged from zero percent to 10.95 percent. A conclusion drawn from these results was that the previous estimate of 10 percent was on the high side.

The S-R Inventory of Hostility in Sport Situations was administered a second time to 43 selected subjects from two of the original four institutions in the study, across the three sports. The triple interaction and error components for the 43 subjects are 1.20 percent and 26.20 percent respectively. It was concluded that the triple interaction is not statistically meaningful and hence not worthwhile to determine, due to the fact that what is being measured might

very well include subject boredom as well as hostility or aggression. Nevertheless, even though the relative contribution of the triple interaction is much smaller than anticipated, there apparently is some tendency for a particular subject to show a particular mode of response in a particular situation.

### Summary

The results of the S-R Inventory of Hostility in Sport Situations were discussed in relation to the expected outcomes of the study, and with the mechanistic interactionist position in mind. The results of the present study were compared to those obtained by Endler and Hunt (82,84) in their studies dealing with anxiety as well as hostility across the general population in non-sport related situations.

The results of the present study were further discussed in relation to the behavioral variance components and percentages of variance attributable to the main effects, simple interactions, and the residual.

Finally, the triple interaction and error term, which reside in the residual component, was discussed. The present study extracted the triple interaction and error term from the residual component in order to determine their relative importance in understanding and ultimately predicting behavior. To paraphrase Endler and Hunt's (86) conclusion: human behavior is complex and, in order to describe it adequately, one must account for not only the main effects but also their interactions.



## Chapter 6

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

The purpose of this investigation was to design an S-R (situation-response) Inventory of Hostility which related to situations encountered in three contact sports. Once established, the data gained as a result of the administration of the inventory were utilized to locate the sources of behavioral variation. A second administration of the inventory was necessary to isolate and partition the triple interaction from the error term in the residual source of variance. A five- to six-week interim period took place between the first and second administrations.

The subjects involved in this study were 108 athletes who participated in one of three contact sports--ice hockey, lacrosse, and soccer--at one of the four institutions selected in New York State during the spring semester of 1977. The playing experience of the athletes ranged from two to 14 years, and their mean age was 20.4 years. The second administration involved 43 selected subjects across all three sports, and from three of the four institutions.

The S-R Inventory of Hostility in Sport Situations, employed a sample of 15 situations and 11 modes of response. The 15 sport situations were specifically chosen from a total

of 43 possible situations on the basis of the responses of 30 randomly selected athletes from the population, again, across sports and institutions. The situations were rated on a five-step scale. The situations chosen were familiar to the athletes either through direct or vicarious experience, and ranged from high to low hostility evoking. The situations were, furthermore, included to evince differing categories of hostile or aggressive responses. The 11 modes of response represented both psychological and physiological response indicators of hostility. The inventory employed a five-point Likert rating scale ranging from "not at all" to "very much," on which the subjects were asked to report to what degree they manifested each of the 11 modes of response in each of the 15 situations.

A factorial design analysis of variance model was utilized to determine the relative contributions of variance from persons, situations, modes of response, simple interactions, and residual. Furthermore, the residual component was partitioned into triple interaction, considered to be psychologically meaningful, and error variance. The procedure used to partition out the variances from the various sources was the mixed effects (subjects random, situations and modes of response fixed) model outlined by Endler (79), and Gleser, Cronbach, and Rajaratnam (91). This analysis determined that the persons, situations, and modes of response contributed 20.17 percent, 12.22 percent, and 5.07 percent, respectively, to the total behavioral variance. The combination from the

simple interactions combined was 27.19 percent, with 15.35 percent attributable to persons x situations, 8.65 percent attributable to persons x modes of response, and 3.19 percent attributable to situations x modes of response. By far the largest single source of behavioral variance (35.35 percent) was attributable to the residual component.

After reviewing the data, the first null hypothesis that neither the persons nor the situations will contribute appreciably greater variance to the total behavioral variance than the variances attributable to the three simple interactions, was accepted. The second null hypothesis stating that the variance attributable to the residual component, as opposed to that attributable to either the main effects or their interactions taken independently, will be an appreciably large part of the total behavioral variance, was accepted.

In a replication of this analysis of the sources of response, using 43 selected subjects, the inventory was re-administered and the data used to partition out the triple interaction (persons x situations x modes of response), considered psychologically meaningful, and error variance, from the residual. Although the variance percentages were not identical with the full sample analysis, the triple interaction was identified to be 1.20 percent and the error term was reported to be 26.20 percent.

It was concluded that neither person nor situation was the major source of behavioral variation in sport-related

situations for the trait of hostility. Individual differences (persons) did contribute more, however to the total behavioral variance for hostility (20 percent) in sport-related situations than for anxiousness (9 percent) in sport-related situations (153,157). The simple interactions--persons x situations, persons x modes of response, and situations x modes of response--were found to be more important in the determination of behavior than the main sources, therefore, the results were interpreted to be supportive of the interactionist position with the reservation that a large portion of the total variance lay within the residual component.

### Conclusions

After completing this study, the investigator feels justified in making the following conclusions:

1. Neither the person nor the situation contribute substantially to the total hostility variance for sport-related situations.
2. Modes of response are not seemingly as important for behavioral predictions of hostility in sport-related situations as in general situations.
3. The simple interactions (persons x situations, persons x modes of response, and situations x modes of response) are as important in determining behavioral variations of hostility in sport-related situations as the main effect (persons, situations, and modes of response).
4. The variance attributable to the person con-

tributed more to the total variance for hostility than for anxiousness in both sport and non-sport-related situations.

5. The results of this study lends a certain amount of support to the interactionist position with the reservation that a large part of behavioral variation resides within the residual component.

6. The partitioning of the residual component into triple interaction (persons x situations x modes of response), does not appreciably change the relative size of the residual component.

7. The S-R Inventory of Hostility in Sport Situations produced results consistent with those of previous similar studies.

#### Recommendations for Further Study

After completion of this study, the investigator advocates the following recommendations for further study:

1. A computer analysis of the modes of response and situational scales should be completed in order to ascertain the factor loading of the scales.

2. A replication of this study should be done using factor-analyzed modes of response and situational scales.

3. A full scale repeated measures study which would allow a complete breakdown of all the interactions of the main effects, and specifically, the triple interaction to be isolated from the error term.

4. An in-depth investigation of the viability of

omega-square ratios as opposed to Golding's (93) generalizability coefficients.

## APPENDICES

## APPENDIX A

List of Participating College Samples  
via Sport, and Numbers Involved

		Number of Subjects
1.	CORNELL UNIVERSITY	
	Ithaca, New York	
	Ice Hockey . . . . .	13
	Soccer . . . . .	30
2.	S. U. N. Y. CORTLAND	
	Cortland, New York	
	Lacrosse . . . . .	20
3.	ELMIRA COLLEGE	
	Elmira, New York	
	Ice Hockey . . . . .	28
4.	ITHACA COLLEGE	
	Ithaca, New York	
	Lacrosse . . . . .	27
	Soccer . . . . .	24
TOTAL		142



## APPENDIX B

Cover Page and General Instructions Read to All Subjects  
Prior to the Administration of the S-R Inventory  
of Hostility in Sport Situations

## INVENTORY OF ATTITUDES TOWARDS SPORT SITUATIONS

Please do not mark this booklet in any way. The answers to the statements in this inventory are to be recorded on the special answer cards provided.

Print your name, date of birth, and your school in the blanks provided on the answer cards. Use the special pencils provided.

PLEASE READ VERY CAREFULLY.

This inventory is a means of studying your reactions to and attitudes to various types of situations. On the following pages are represented 15 situations with which each of you as athletes will likely be able to identify. For each of these situations, certain very common types of personal reactions and feelings are listed. Indicate the alternative on the answer cards, representing the five points on the scales shown in this booklet, the degree to which you would show these reactions and feelings in the situations indicated.

Here is an example:

AN OPPONENT INTENTIONALLY FALLS AND A FOUL/PENALTY IS CALLED AGAINST YOU

Feel Irritated	1	2	3	4	5
NOT AT ALL					VERY MUCH

If you feel very irritated in this situation, then darken 5. If you are somewhat irritated, then darken 2,3, or 4, depending on how much irritation. If you do not feel irritated at all, then darken 1.

THERE ARE NO RIGHTS OR WRONGS. ANSWERS ARE NO REFLECTION ON YOUR CHARACTER AND WILL BE KEPT IN THE STRICTEST CONFIDENCE. IT IS HOPED, WITH YOUR HELP, THAT THIS STUDY MAY HELP TO SOLVE SOME OF THE UNANSWERED QUESTIONS IN SPORT.

## APPENDIX C

List of Situations Represented in the S-R  
Inventory of Hostility

1. Your team-mate fails on a defensive play and you are hit hard upon receiving possession.
2. At the onset of the game, the coach tells you to go out there and hit anything and everything that moves.
3. You are on the bench and a team member is brought crashing to the surface from behind.
4. Your team-mate tells you to get "psyched" and be aggressive.
5. An official makes what you consider to be an unfair decision.
6. You are up by a few goals and are constantly on the attack to a much weaker team.
7. A player throws a punch at you and you retaliate; the official sees the action but only penalizes you.
8. Your play is being cramped by an opponent who has been assigned specifically to keep you out of the play.
9. Almost immediately after the game begins you are brought crashing to the ground, fair and square.
10. You easily fake past your opponent and he pulls you down from behind in a desperate attempt to stop you from scoring.
11. The opposing team emerges from their dressing room only after the officials have given repeated warnings, while you have been out there waiting to begin the contest.
12. After serving on the varsity team for the past few weeks, you are bluntly told to report to J. V. practice from now on.
13. Throughout the game a number of spectators have been constantly making fun of you.
14. As a returning letterman you discover that your position on the team is being challenged by a freshman.

15. As there are no officials nearby you have the opportunity to retaliate against a player who has roughed you up. He is in a vulnerable position.

## APPENDIX D

## Sample Page of the S-R Inventory of Hostility

YOUR TEAM-MATE FAILS ON A DEFENSIVE PLAY AND YOU  
ARE HIT HARD UPON RECEIVING POSSESSION

Card #1

- |                                     |            |   |   |   |           |
|-------------------------------------|------------|---|---|---|-----------|
| 1. WANT TO HIT SOMETHING OR SOMEONE | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 2. LOSE PATIENCE                    | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 3. SWEAR                            | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 4. GRIND TEETH                      | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 5. HEART BEATS FASTER               | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 6. WANT TO YELL                     | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 7. FROWN                            | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 8. FEEL IRRITATED                   | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 9. HANDS TREMBLE                    | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 10. BECOME ENRAGED                  | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |
| 11. BECOME TENSE                    | 1          | 2 | 3 | 4 | 5         |
|                                     | NOT AT ALL |   |   |   | VERY MUCH |
| <hr/>                               |            |   |   |   |           |

## BIBLIOGRAPHY

## Books

1. Abelson, R. P. "Situational Variables in Personality Research." In S. Messick, and J. Ross, eds. Measurement in Personality and Cognition. New York: Wiley, 1962.
2. Alker, H. A. "Beyond ANOVA Psychology in the Study of Person-Situation Interactions." In D. Magnusson, and N. S. Endler, eds. Personality at the Crossroads: Current Issues in Interactional Psychology. Hillsdale, N. J.: Lawrence Erlbaum Associates, 1977.
3. Angyal, A. Foundation For A Science of Personality. Cambridge, Massachusetts: Harvard University Press, 1941.
4. Arnoult, M. D. "The Specifications of a 'Social' Situation." In S. B. Sells, ed. Stimulus Determinants of Behavior. New York: Ronald Press, 1963.
5. Barker, R. G. Ecological Psychology. Stanford, California: Stanford University Press, 1968.
6. Berkowitz, L. Aggression: A Social Psychological Analysis. New York: McGraw-Hill, 1962.
7. \_\_\_\_\_. "Sports, Competition, and Aggression." In I. D. Williams, and L. M. Wankel, eds. Proceedings of the Fourth Canadian Psycho-Motor Learning and Sport Psychology Symposium. Ottawa: Department of National Health and Welfare, 1973.
8. Bredemeir, B. "The Assessment of Reactive and Instrumental Athletic Aggression." In D. M. Landers, ed. Psychology of Sport and Motor Behavior II. University Park, College of HPER: Pennsylvania State University Press, 1975.
9. Brunswik, E. Perception and the Representative Design of Psychological Experiments. Berkeley: University of California Press, 1956.
10. Butcher, J. N. "Personality Assessment: Problems and Perspectives." In J. N. Butcher, ed. Objective Personality Assessment. New York: Academic Press, 1972.
11. Carron, A. V. "Personality and Athletics: A Review." In B. S. Rushall, ed. The Status of Psychomotor Learning and Sport Psychology Research. Dartmouth, Nova Scotia: Sports Science Associates, 1975.

12. Cattell, R. B. "Formulating the Environmental Situation in Behavior Theory." In S. B. Sells, ed. Stimulus Determinants of Behavior. New York: Ronald Press, 1963.
13. Cofer, C. N., and W. R. Johnson. "Personality Dynamics in Relation to Exercise and Sports." In W. R. Johnson, ed. Science and Medicine of Exercise and Sports. New York: Harper, 1960.
14. Cronbach, L. J., and others. The Dependability of Behavioral Measurements: Theory of Generalizability for Scores and Profiles. New York: Wiley, 1972.
15. Dollard, J., and others. Frustration and Aggression. New Haven, Connecticut: Yale University Press, 1939.
16. Endler, N. S., and D. Magnusson, eds. Interactional Psychology and Personality. Washington: Hemisphere, 1976.
17. Fisher, A. C. "Sport Personality Assessment: Fact, Fiction and Methodological Re-examination." In R. E. Stadulis, ed. Research and Practice in Physical Education. Champaign, Illinois: Human Kinetics, 1977.
18. Fromm, E. The Anatomy of Human Destructiveness. New York: Holt, Rhinehart, and Winston, 1973.
19. Hartshorne, H., and M. A. May. Studies in the Nature of Character. Volume I. Studies in Deceit. New York: Macmillan, 1928.
20. Hays, W. L. Statistics for Psychologists. New York: Holt, Rhinehart, and Winston, 1963.
21. Horsfall, J. S., A. C. Fisher, and H. H. Morris. "Sport Personality Assessment: A Methodological Re-examination." In D. M. Landers, ed. Psychology of Sport and Motor Behavior II. University Park, College of HPER: Pennsylvania State University Press, 1975.
22. Kane, J. E. "Personality and Physical Ability." In K. Kato, ed. Proceedings of the International Congress of Sports Sciences. Tokyo: Japanese Union of Sport Science, 1964.
23. \_\_\_\_\_. "Personality and Physical Abilities." In G. S. Kenyon, ed. Contemporary Psychology of Sport. Chicago: Athletic Institute, 1970.



24. ———. "Personality, Body Concept and Performance."  
In J. E. Kane, ed. Psychological Aspects of Physical Education and Sport. London: Routledge and Kegan Paul, 1972.
25. Kantor, J. R. Interbehavioral Psychology. Bloomington, Indiana: Principia Press, 1959.
26. ———. Principles of Psychology: Volume I. Bloomington, Indiana: Principia Press, 1924.
27. ———. Principles of Psychology: Volume II. Bloomington, Indiana: Principia Press, 1926.
28. Koffka, K. Principles of Gestalt Psychology. New York: Harcourt Brace, 1935.
29. Kroll, W. "Current Strategies and Problems in Personality Assessment in Athletics." In L. E. Smith, ed. Psychology of Motor Learning. Chicago: Athletic Institute, 1970.
30. Layman, E. M. "Aggression in Relation to Play and Sports." In G. S. Kenyon, ed. Contemporary Psychology of Sport. Chicago: Athletic Institute, 1970.
31. ———. "Contributions of Exercise and Sports to Mental Health and Social Adjustment." In W. R. Johnson, ed. Science and Medicine of Exercise and Sports. New York: Harper, 1960.
32. Lewin, K. A Dynamic Theory of Personality: Selected Papers. New York: McGraw-Hill, 1935.
33. ———. Field Theory in Social Sciences: Selected Theoretical Papers. New York: Harper, 1951.
34. ———. Principles of Topological Psychology. New York: McGraw-Hill, 1936.
35. ———. "The Conceptual Representation and the Measurement of Psychological Forces." In D. K. Adams, and H. Lundholm, eds. Contributions to Psychological Theory. Volume I. Durham, North Carolina: Duke University Press, 1938.
36. Lorenz, K. On Aggression. London: Methuen, 1966.
37. Magnusson, D., and N. S. Endler, eds. Personality at the Crossroads: Current Issues in Interactional Psychology. Hillsdale, N. J.: Lawrence Erlbaum Associates, 1977.
38. Mischel, W. Personality and Assessment. New York: Wiley, 1968.

39. Morgan, W. P. "Sport Psychology." In R. N. Singer, ed. The Psychomotor Domain Movement Behavior. Philadelphia: Lea and Febiger, 1972.
40. Murphy, G. Personality: A Biosocial Approach to Origins and Structure. New York: Harper, 1947.
41. Murray, H. A. Explorations in Personality. New York Oxford University Press, 1938.
42. \_\_\_\_\_. "Towards a Classification of Interaction." In T. Parsons, and E. A. Shils, eds. Towards a General Theory of Action. Cambridge, Massachusetts: Harvard University Press, 1951.
43. Olweus, D. "A Critical Analysis of the 'Modern' Interactionist Position." In D. Magnusson, and N. S. Endler, eds. Personality at the Crossroads: Current Issues in Interactional Psychology. Hillsdale, N. J.: Lawrence Erlbaum Associates, 1977.
44. \_\_\_\_\_. "Personality and Aggression." IN J. K. Cole, and D. D. Jensen, eds. Nebraska Symposium on Motivation-1972. Lincoln: University of Nebraska Press, 1973.
45. Overton, W. E., and H. W. Reese. "Models of Development: Methodological Implications." In J. R. Nesselroade, and H. W. Reese, eds. Life-Span Developmental Psychology: Methodological Issues. New York: Academic Press, 1973.
46. Rotter, J. B. Social Learning and Clinical Psychology. Englewood Cliffs, N. J.: Prentice Hall, 1954.
47. Rushall, B. S. "An Evaluation of the Relationship Between Personality and Physical Performance Categories." In G. S. Kenyon, ed. Contemporary Psychology of Sport. Chicago: Athletic Institute, 1970.
48. \_\_\_\_\_. "Applied Psychology in Sport." In B. S. Rushall, ed. The Status of Psychomotor Learning and Sport Psychology. Dartmouth, Nova Scotia: Sport Sciences Associates, 1975.
49. \_\_\_\_\_, and D. Siedentop. The Development and Control of Behavior in Sport and Physical Education. Philadelphia: Lea and Febiger, 1972.
50. Scheffe, H. The Analysis of Variance. New York: Wiley, 1959.

51. Sells, S. B. "Dimensions of Stimulus Situations Which Account for Behavior Variance." In S. B. Sells, ed. Stimulus Determinants of Behavior. New York: Ronald Press, 1963.
52. Sherif, M., and C. W. Sherif. An Outline of Social Psychology. New York: Harper, 1956.
53. Singer, J. E. "Introduction: The Psychological Study of Aggression." In J. E. Singer, ed. The Control of Aggression and Violence: Cognitive and Physiological Factors. New York: Academic Press, 1971.
54. Singer, R. N. "Reaction to 'Sport and Personality Dynamics.'" Proceedings of 72nd National College Physical Education Association for Men, 72:76-79, 1969.
55. Storr, A. Human Aggression. New York: Atheneum, 1968.
56. Straub, W. F. "Approaches to Personality Assessment of Athletes: Personologism, Situationism, and Interactionism." In R. E. Stadulis, ed. Research and Practice in Physical Education. Champaign, Illinois: Human Kinetics, 1977.
57. Wankel, L. M. "An Examination of Illegal Aggression in Intercollegiate Hockey." In I. D. Williams, and L. M. Wankel, eds. Psychomotor Learning and Sports Psychology Symposium. Ottawa: Department of National Health and Welfare, 1973.
58. Zigler, E. "Learning, Development, and Social Class in Socialization Process." In M. H. Marx, ed. Learning: Interaction. London: Collier-Macmillan, 1970.

#### Periodicals

59. Adelson, J. "Personality," Annual Review of Psychology, 20:217-252, 1969.
60. Alker, H. A. "Is Personality Situationally Specific or Intrapsychically Consistent?" Journal of Personality, 40:1-16, 1972.
61. Argyle, M., and B. R. Little. "Do Personality Traits Apply to Social Behavior?" Journal for the Theory of Social Behavior, 2:1-35, 1972.
62. Barker, R. G. "Explorations in Ecological Psychology," American Psychologist, 20:1-14, 1965.

63. Bem, D. J. "Constructing Cross-Situational Consistencies in Behavior: Some Thoughts on Alker's Critique of Mischel," Journal of Personality, 40:17-26, 1972.
64. Berkowitz, L., and R. G. Geen. "Stimulus Qualities of the Target of Aggression: A Further Study," Journal of Personality and Social Psychology, 5:364-368, 1967.
65. Block, J. "Some Reasons for the Apparent Inconsistency of Personality," Psychological Bulletin, 70:210-212, 1968.
66. Bowers, K. S. "Situationism in Psychology: An Analysis and a Critique," Psychological Review, 80:307-336, 1973.
67. Burton, R. V. "Generality of Honesty Reconsidered," Psychological Review, 70:481-499, 1963.
68. Carlson, R. "Personality," Annual Review of Psychology, 26:393-414, 1975.
69. Cartwright, D. "Trait and Other Sources of Variance in the S-R Inventory of Anxiousness," Journal of Personality and Social Psychology, 32:408-414, 1975.
70. Cattell, R. B. "Personality, Role, Mood, and Situation-Perception: A Unifying Theory of Modulators," Psychological Review, 70:1-18, 1963.
71. Cooper, L. "Athletics, Activity and Personality: A Review of the Literature," Research Quarterly, 40:17-22, 1969.
72. Cornfield, C. H., and J. W. Tukey. "Average Values of Mean Squares in Factorials," Annals of Mathematical Statistics, 27:907-949, 1956.
73. Cronbach, L. J. "Coefficient Alpha and the Internal Structure of Tests," Psychometrika, 16:297-334, 1951.
74. Dahlstrom, W. C. "Personality," Annual Review of Psychology, 21:1-48, 1970.
75. Edwards, A. L., and R. D. Abbot. "Measurement of Personality Traits: Theory and Technique," Annual Review of Psychology, 24:241-270, 1973.
76. Ekehammar, B. "Interactionism in Personality from a Historical Perspective," Psychological Bulletin, 81:1026-1048, 1974.

77. \_\_\_\_\_, and D. Magnusson. "A Method to Study Stressful Situations," Journal of Personality and Social Psychology, 27:176-179, 1973.
78. \_\_\_\_\_, and L. Richlander. "An Interactionist Approach to the Study of Anxiety," Scandinavian Journal of Psychology, 15:4-14, 1974.
79. Endler, N. S. "Estimating Variance Components from Mean Squares for Random and Mixed Effects Analysis of Variance Models," Perceptual and Motor Skills, 22:559-570, 1966.
80. \_\_\_\_\_. "The Case for Person-Situation Interactions," Canadian Psychological Review, 16:12-21, 1975.
81. \_\_\_\_\_. "The Person Versus the Situation--A Pseudo-Issue? A Response to Alker," Journal of Personality, 41:287-303, 1973.
82. \_\_\_\_\_, and J. McV. Hunt. "Generalizability of Contributions from Sources of Variance in the S-R Inventories of Anxiousness," Journal of Personality, 37:1-24, 1969.
83. \_\_\_\_\_. "Sources of Behavioral Variance as Measured by the S-R Inventory of Anxiousness," Psychological Bulletin, 65:336-346, 1966.
84. \_\_\_\_\_. "S-R Inventories of Hostility and Comparisons of the Proportions of Variance from Persons, Responses and Situations for Hostility and Anxiousness," Journal of Personality and Social Psychology, 9:309-315, 1968.
85. \_\_\_\_\_. "Triple Interaction Variance in the S-R Inventory of Anxiousness," Perceptual and Motor Skills, 27:1098, 1968.
86. \_\_\_\_\_, and A. J. Rosenstein. "An S-R Inventory of Anxiousness," Psychological Monographs, 76 (17, Whole Number 536), 1962.
87. Endler, N. S., and M. Okada. "A Multidimensional Measure of Trait Anxiety: The S-R Inventory of General Trait Anxiousness," Journal of Consulting and Clinical Psychology, 43:319-329, 1975.
88. Endler, N. S., and R. Shedletsky. "Trait Versus State Anxiety, Authoritarianism, and Ego Threat Versus Physical Threat," Canadian Journal of Behavioral Science, 5:347-361, 1973.

89. Feshbach, S. "The Function of Aggression and the Regulation of the Aggressive Drive," Psychological Review, 27:257-272, 1964.
90. Frederiksen, N. "Toward a Taxonomy of Situations," American Psychologist, 27:114-123, 1972.
91. Gleser, G. C., L. J. Cronbach, and R. N. Rajaratnam. "Generalizability of Sources Influenced by Multiple Sources of Variance," Psychometrika, 30: 395-418, 1965.
92. Goldfried, M. R., and R. N. Kent. "Traditional Behavioral Personality Assessment: A Comparison of Methodological and Theoretical Assumptions," Psychological Bulletin, 77:409-420, 1972.
93. Golding, S. L. "Flies in the Ointment: Methodological Problems in the Analysis of the Percentages of Variance Due to Persons and Situations," Psychological Bulletin, 82:278-288, 1975.
94. Henry, F. M. "Personality Differences in Athletes, Physical Education, and Aviation Students," Psychological Bulletin, 38:745, 1941.
95. Holtzman, W. "Recurring Dilemmas in Personality Assessment," Journal of Projective Technique and Personality Assessment, 28:144-150, 1964.
96. Holzman, P. S. "Personality," Annual Review of Psychology, 25:247-276, 1974.
97. Hunt, J. McV. "Traditional Personality Theory in the Light of Recent Evidence," American Scientist, 53:80-96, 1965.
98. Husman, B. F. "Sport and Personality Dynamics," Proceedings 72nd. National College Physical Education Association for Men, 72:56-70, 1969.
99. Jessor, R. "Phenomenological Personality Theories and the Data Language of Psychology," Psychological Review, 63:173-180, 1956.
100. \_\_\_\_\_. "The Problem of Reductionism in Psychology," Psychological Review, 65:170-178, 1958.
101. Klein, G. S., H. L. Barr, and D. L. Wolitzky. "Personality," Annual Review of Psychology, 18:467-560, 1967.
102. Kroll, W. "Sixteen Personality Factor Profiles of Collegiate Wrestlers," Research Quarterly, 38:49-57, 1967.

103. ———, and R. B. Carlson. "Discriminant Function and Hierarchical Grouping Analysis of Karate Participants' Personality Profiles," Research Quarterly, 38:405-411, 1967.
104. Kroll, W., and K. H. Peterson. "Study of Values Test and Collegiate Football Teams," Research Quarterly, 36:433-447, 1965.
105. Layman, E. M. "Emotional Health," Journal of Health, Physical Education, and Recreation, 28:22-23, March, 1957.
106. Likert, R. "A Technique for the Measurement of Attitude," Archives of Psychology, 140:1-55, 1932.
107. Magnusson, D. "An Analysis of Situational Dimensions," Perceptual and Motor Skills, 32:851-867, 1971.
108. ———. "The Individual in the Situation: Some Studies on Individuals' Perception of Situations," Studia Psychologica, 16:124-132, 1974.
109. ———. "The Person and the Situation in an Interaction Model of Behavior," Scandinavian Journal of Psychology, 17:81-96, 1976.
110. ———, and B. Ekehammar. "An Analysis of Situational Dimensions: A Replication," Multivariate Behavioral Research, 8:331-339, 1973.
111. ———. "Perceptions of and Relations to Stressful Situations," Journal of Personality and Social Psychology, 31:1147-1154, 1975.
112. Magnusson, D., M. Gerzen, and B. Nyman. "The Generalization of Behavioral Data: 1. Generalization from Observation on One Occasion," Multivariate Behavioral Research, 3:295-320, 1968.
113. Magnusson, D., and B. Heffler. "The Generality of Behavioral Data: III. Generalization as a Function of the Number of Observational Situations," Multivariate Behavioral Research, 4:29-42, 1969.
114. ———, and B. Nyman. "The Generalizability of Behavioral Data: II. Replication of an Experiment on Generalization from Observation on One Occasion," Multivariate Behavioral Research, 3:415-422, 1968.
115. Martens, R. "Anxiety and Motor Behavior: A Review," Journal of Motor Behavior, 3:151-179, 1971.
116. ———. "The Paradigmatic Crises in American Sport Personology," Sportwissenschaft, 5:9-24, 1975.

117. Mischel, W. "Continuity and Change in Personality," American Psychologist, 24:1012-1018, 1969.
118. \_\_\_\_\_. "Towards a Cognitive Social Learning Re-conceptualization of Personality," Psychological Review, 80:252-283, 1973.
119. Moos, R. H. "Conceptualizations of Human Environments," American Psychologist, 28:652-665, 1973.
120. \_\_\_\_\_. "Differential Effects of Psychiatric Ward Settings on Patient Change," Journal of Nervous and Mental Disease, 5:316-321, 1970.
121. \_\_\_\_\_. "Differential Effects of Ward Settings on Psychiatric Patients," Journal of Nervous and Mental Disease, 145:272-283, 1967.
122. \_\_\_\_\_. "Situational Analysis of a Therapeutic Community Milieu," Journal of Abnormal Psychology, 73:49-61, 1968.
123. \_\_\_\_\_. "Sources of Variance in Response to Questionnaires and in Behavior," Journal of Abnormal Psychology, 74:405-412, 1969.
124. \_\_\_\_\_, and S. Clemes. "Multivariate Study of the Patient-Therapist System," Journal of Consulting Psychology, 31:119-130, 1967.
125. Moos, R. H., and D. Daniels. "Differential Effects of Ward Settings on Psychiatric Staff," Archives of General Psychiatry, 17:75-83, 1967.
126. Morgan, W. P. "Physical Fitness and Emotional Health: A Review," American Corrective Therapy Journal, 23:124-127, 1969.
127. Moyer, K. E. "The Physiology of Violence," Psychology Today, 7:35-38, July, 1973.
128. Nelsen, E. A., R. F. Grinder, and M. L. Mutterer. "Sources of Variance in Behavioral Measures of Honesty in Temptation Situations: Methodological Analyses," Developmental Psychology, 1:265-279, 1969.
129. Ogilvie, B. C. "Psychological Consistencies Within the Personality of High-Level Competitors," Journal of the American Medical Association, 205:156-162, 1968.
130. Pervin, L. A. "Performance and Satisfaction as a Function of Individual-Environment Fit," Psychological Bulletin, 69:56-68, 1968.



131. Phares, E. J., and J. T. Lamiell. "Personality," Annual Review of Psychology, 28:113-140, 1977.
132. Raush, H. L. "Interaction Sequences," Journal of Personality and Social Psychology, 2:487-499, 1965.
133. \_\_\_\_\_. "Process and Change--A Markov Model for Interaction," Family Process, 11:275-298, 1972.
134. \_\_\_\_\_, A. T. Dittmann, and T. J. Taylor. "Person, Setting and Change in Social Interaction," Human Relations, 12:361-378, 1959.
135. \_\_\_\_\_. "The Interpersonal Behavior of Children in Residential Treatment," Journal of Abnormal and Social Psychology, 58:9-26, 1959.
136. Raush, H. L., I. Farbman, and L. G. Llewellyn. "Person, Setting and Change in Social Interaction: II. A Normal-Control Study," Human Relations, 13:305-332, 1960.
137. Sage, G. H. "An Assessment of Personality Profiles Between and Within Intercollegiate Athletes from Eight Different Sports," Sportwissenschaft, 2:409-418, 1972.
138. Sarason, I. G., and R. E. Smith. "Personality," Annual Review of Psychology, 22:393-446, 1971.
139. \_\_\_\_\_, and E. Diener. "Personality Research: Components of Variance Attributable to the Person and the Situation," Journal of Personality and Social Psychology, 32:199-204, 1975.
140. Scott, M. G. "The Contributions of Physical Activity to Psychological Development," Research Quarterly, 31:307-320, 1960.
141. Sechrest, L. "Personality," Annual Review of Psychology, 27:1-27, 1976.
142. Sells, S. B. "An Interactionist Looks at the Environment," American Psychologist, 18:696-702, 1963.
143. \_\_\_\_\_. "Ecology and the Science of Psychology," Multivariate Behavioral Research, 1:131-144, 1966.
144. Silverstein, A. B., and G. Fisher. "Estimated Variance Components in the S-R Inventory of Anxiousness," Perceptual and Motor Skills, 27:740-742, 1968.
145. Singer, J. L., and D. G. Singer. "Personality," Annual Review of Psychology, 23:374-412, 1972.

146. Smith, L. E. "Personality and Performance Research--  
New Theories and Directions Required," Quest, 13:  
74-83, 1970.
147. Vale, J. R., and G. R. Vale. "Individual Differences  
and General Laws in Psychology: A Reconciliation,"  
American Psychologist, 24:1093-1108, 1969.
148. Wachtel, P. L. "Psychodynamics, Behavior Therapy  
and the Implausible Experimentor: An Enquiry into  
the Consistency of Personality," Journal of  
Abnormal Psychology. 82:324-334, 1973.
149. Wallace, J. "An Abilities Conception of Personality:  
Some Implications for Personality Measurement,"  
American Psychologist, 21:132-138, 1966.
150. Wallach, M. A., and M. I. Leggett. "Testing the  
Hypothesis That a Person Will be Consistent:  
Stylistic Consistency Versus Situational Specificity  
in Size of Children's Drawings," Journal of  
Personality, 40:309-330, 1972.
151. Wiggins, J. S. "Personality Structure," Annual Review  
of Psychology, 19:293-350, 1968.

#### Unpublished Sources

152. Cartwright, D. Personal correspondence with A. C. Fisher,  
June, 1977.
153. Czarnecki, L. R. "Sources of Anxiety Variance in Sport  
Situations." Master's thesis, Ithaca College,  
1977.
154. Endler, N. S., and W. J. Jobst. "Components of  
Variance Derived from Mean Squares For Random, Mixed,  
and Fixed Analysis of Variance Models." Urbana,  
Illinois: University of Illinois Psychological  
Department Laboratory, 1964. (Mimeographed.)
155. Fisher, A. C., and F. Ahart. "Personality Assessment:  
Trait Approach, Situational-Specificity, or What?"  
Paper presented at the First Canadian Congress for  
Multi-Disciplinary Study of Sport, Montreal,  
October, 1973. (Mimeographed.)
156. Fisher, A. C., S. Borowitz, and H. H. Morris.  
"Behavioral Rigidity Across Sport Situations."  
Paper presented at the North American Society  
for the Psychology of Sport and Physical Activity  
Annual Meeting, Ithaca College, May, 1977.  
(Mimeographed.)

157. Horsfall, J. S. "Location of Sources of Behavioral Variance in Sport Related Situations." Master's thesis, Ithaca College, 1975.
158. Kane, J. E. Personal correspondence with A. C. Fisher, November, 1973.
159. Rushall, B. S. "A Direction for Contemporary Sport Psychology." Paper presented at the First Canadian Congress of the Multi-Disciplinary Study of Sport and Physical Activity, Montreal, October, 1973.
160. \_\_\_\_\_. "The Demonstration and Evaluation of a Research Model for the Investigation of the Relationship Between Personality and Physical Performance Categories." Doctoral dissertation, University of Indiana, 1969.
161. Rushton, J. P., and N. S. Endler. "Person by Situation Interactions in Academic Achievement." London, Ontario: University of Western Ontario, Department of Psychology, 1977. (Mimeographed.)
162. Ryan, E. D. "Current Status and Future Direction of Personality Research Related to Motor Behavior." Paper presented at the North American Society for Psychology of Sport and Physical Activity Conference, Anaheim, California, March, 1974. (Mimeographed.)